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3dcreative

Issue 085 September 2012

Andrius Balciunas

3D Character Artist

Eyes wide open

Project Overview
by Baolong Zhang

Gallery

Gallery - 10 of the best images from around the world!

DOWNLOAD RESOURCES

- Free Textures & Scenes

Cover image by Andrei Szasz

BUILDING DROIDS

Andrei Szasz delivers the penultimate chapter of our ever impressive droids series. Follow Andrei's step-by-step guide to see how he brings a **Recon Droid** to life.



Birds of a Feather, Flock Together

Matt Chandler (3dsmax) and **Mike Zugschwert** (Maya) conclude our FX, Particles and Dynamics series with the creation of flocking birds.



Character Rendering and Lighting

In the final part of our **Character Production** series, **Rodrigue Pralier** and **Anto Juricic** teach us how to create realistic renders of our old guys.



Unreal Games Engine Environment

Andrew Finch continues to build upon his environment and shows how to apply base textures in the latest part of his UDK **Submarine Pen** series.



EDITORIAL

Welcome to the September issue of 3DCreative! In this month's magazine we continue to progress further with some of our great tutorial series, as others reach an end. With a jam packed issue full of inspiring tutorials and images, you won't know where to begin!

Let's start things off with the awesome image on the cover of this issue, which was created by the talented Andrei Szasz for our Building Droids series. As ever this series proves to be an priceless source of tips and tricks, as Andrei turns a concept for a recon droid into a 3D model using 3ds Max. Sharing his step-by-step approach to modeling the droid, he talks us through how to create each part using tools and simple techniques.

Our enthralling FX, Particles and Dynamics series has come to an end this month, as our industry professionals talk us through how to animate flocks of birds. Mike Zugschwert demonstrates this in Maya, while Matt Chandler shows us in 3ds Max.

The Unreal Games Engine tutorial series is well under way now, with Andrew Finch guiding us through using programs such as 3ds Max, Photoshop and UDK to create a playable game level. This time around, Andrew demonstrates how to finalize the environment, by continuing to use the exported geometry in 3ds Max to aid us in building more architectural assets, ready to populate the scene with objects and effects.

We have another series finale this month, with the last chapter in our Modeling Realistic Heads series, where our talented artists have walked us through the creation of one of the most popular subject matters: the human bust. With all the different pieces modeled and textured, the only thing left to do is light and render the scene. Rodrigue Pralier continues to use 3ds Max and Anto Juricic demonstrates the process using Maya.

It doesn't end there though! Even though we are fit to burst with must-have tutorials, we also have a Making Of by talented character artist Baolong Zhang, as well as an interview with the brilliant Andrius Balciunas. If that wasn't enough we have our usual stunning gallery featuring work by Andrey Goncharov, Patrick Evrard, Aleks Kuskov and many more!

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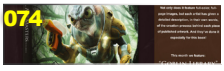

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Image by Andrey Goncharov



Get the most out of your Magazine!

If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!







Setting up your PDF reader

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: DOWNLOAD!

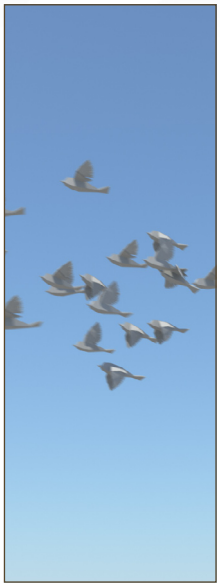
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2. Go to the View menu, then Page Display;
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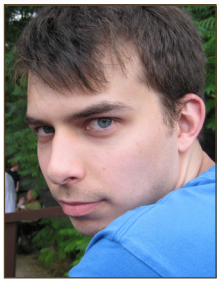
That's it!

Contributing Artists

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in the 3DCreative magazine, please contact: simon@3dtotal.com



Mike Zugschwert



Mike Zugschwert is an FX Artist who works in Realflow, Maya, and 3DS Max. He was the Lead FX Artist for the short film Azureus Rising and now applies his talents to television commercials. He is currently working at Make in Minneapolis, MN.

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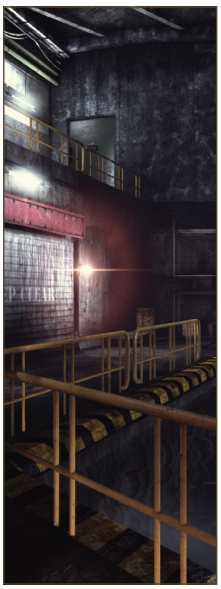
Andrei Szasz

Andrei Szasz is a senior character artist at Lionhead Studios/ Microsoft Games Studios. He has studied art since high school, specializing in painting, and then during university Andrei started learning 3D. Andrei has done most things in 3D from animation to interior design, advertising, TV commercials and games. He hopes to work in 3D for many years.

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Andrew Finch



Aged 30 and living in the great city of Birmingham, in the U.K. He has a degree in 3D Animation which inspired his passion for environment art. He now works as an environment artist at Codemasters. He says, "Working in the games industry is exciting: you never know what the next project will be and there's always something new to learn. This helps to keep you creative and grow as an artist." afinchy@googlemail.com

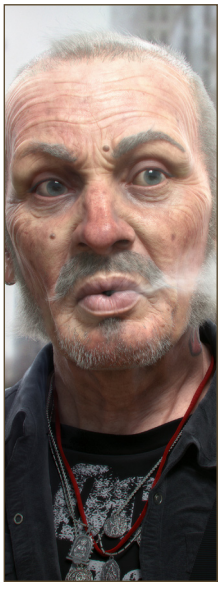


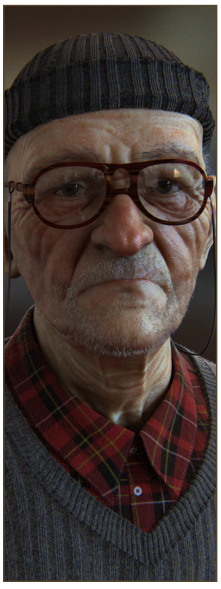
Rodrigue Pralier

Rodrigue Pralier is the lead Character artist at Bioware Montreal Quebec. After working in the games industry for nearly a decade he has recently shipped the highly anticipated game Mass Effect 3 and has previously worked on other games like Army Of Two:40th day.

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rodriguepralier@hotmail.com





Anto Juricic



Anto Juricic Toni is a character artist and he currently lives in Bosnia and Herzegovina, where he works at Primetime Studio as a modeler and texture artist on animated features. Along with his passion for creating CG characters he also enjoys teaching others and sharing his techniques through many online tutorials and publications.

http://anto-toni.cgsociety.org/gallery/

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Image Courtesy of Ali Zafati
ZBRUSH
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Pixologic.com/resellers



"At that time games and cinematic CG videos really inspired me and I was keen to learn how they are made."

INTERVIEW WITH

Andrius Balciunas

This month's interview is with talented Lithuanian artist, Andrius Balciunas. Having experience in the game industry, Andrius talks to us about continuing to expand his skills as a CG generalist, as well as working as a freelancer at the same time. Female characters often crop up in his CG work, but he doesn't limit himself to them, as he discusses the meaning and inspiration behind his work.

Hi Andrius, it's great to speak to you. I had a look on some of your sites to learn a little about you, but couldn't find a great deal. Can you tell us where you came from, how you became interested in the industry and what it is that you do today?

Hi. I come from Lithuania, a small country in Europe. I became interested in CG in 2001, when I was still in school. At that time games and cinematic CG videos really inspired me and I was keen to learn how they were made. After years of learning and practicing various tools, I started to work professionally in the game industry in 2007. Today I consider myself a CG generalist in this industry and I freelance as an independent CG artist.

What are the opportunities like for an artist who wants a career in CG art in Lithuania? Are there many CG schools or do you have to teach yourself?

Well, there aren't many CG artists in Lithuania and most of them are working with foreign clients here anyway. In other words, outsourcing is quite popular in Lithuania's CG field. As for teaching, there aren't any CG schools here either. We have a few small academies that give some basic courses in software like 3ds Max or Photoshop, but in general, nothing serious.





If you want something more professional, you have to learn everything yourself.

"Characters are definitely a subject that I love."

I notice that your gallery is particularly full of images of girls. What do you think it is that makes girls such a popular subject matter for CG artists?

Characters are definitely a subject that I love. I think that most CG artists would agree that they are one of the most challenging to create in the CG field. We humans are very sensitive to the emotional expressions of other people, which is difficult to overcome when you are making a character. I like this challenge. I like to tweak the model and everything until it evokes an emotional response in me. This is the most important task when I work. Making it photorealistic is the second goal, when it's necessary.

Of all of the characters that you have created so far, which would you say is your favorite and why?

My favorite character is the one I've created for my image *Homesick*. The feeling of homesickness was something I was experiencing at the time, so I used it for this character. Sometimes people say to me that I have a tendency to express my women characters as being beautiful, but sad or in disadvantaged situations, and that's definitely true of this image!



Is it hard to survive as a freelance artist? Do you find that it is easy to get work and how do you advertise yourself as an artist?

I don't do anything fancy. I post my personal artwork on CG portals, which sort of works as personal advertising, and that's about all. It's definitely not enough actually, but for now I can't really think of any better, more effective ways.

As for the level of difficulty to survive as a freelancer, I guess it depends, but for me personally it's not easy and that's mainly because of general instability. You can't really plan or predict your financial situation, because you never know how many clients you will have in the next year. For now I also have a part-time job, which acts as a back up in this situation, so I can't really complain much. In any case, I'm looking forward to expanding my list of clients with whom I could work with on long-term projects.



I always like to take a good look at people's work and pull out the details that make their images strong. In your images I think your texturing is particularly good. Can you tell me a little about how you approach texturing a character?

Thanks. I actually always think that my texturing skills are weak; it's true. I believe the thing that I manage to compensate that with is good shading and lighting. I have an approach to making characters, which I have developed through personal experience. When I start to set up a shader for my character, I always only make small resolution tests and the goal is to make it look as realistic as possible without any textures. When I have that, I move on to texturing, pushing the overall look and quality further.



I have been having a look at the software you use in images and it appears that you use 3ds Max, but don't seem to use sculpting programs. Is there any reason why you



choose to model characters in this way when so many people are turning to ZBrush and Mudbox to create characters?

I do use sculpting programs sometimes, but I use them only when I feel it's necessary. Female and children characters only have subtle variations in their skin, so most of the time sculpting wrinkles or any additional details is not required. Sometimes I see very detailed CG characters made with bad shading and/or lighting, which absolutely spoils all realism. Opposed to this, a good example is when you see an unfocused, bad photo of a person, and even though you don't see any details in that photo you can definitely see that it's real. That's why I believe that shading, lighting and natural

"I ENJOY EVERY PROJECT WHERE I HAVE THE OPPORTUNITY TO USE MY ARTISTIC SKILLS AS MUCH AS MY TECHNICAL SKILLS."





proportions of the model are the most important parts of a CG character. The right balance is hard to catch though.

Which is your favorite project that you have worked on so far and why?

It's hard to say. For commercial projects, what I can definitely say is that I enjoy ones where I have the opportunity to use my artistic skills as much as my technical skills. I always want to be involved in more than just a technical capacity. As for personal projects, I believe I enjoyed making my image *Homesick* the most. I consider



it to be my most serious personal artwork so far, and also the largest and most technical.

What do you like to do in the time that you get to spend away from your computer? Do you find your free time a great source of inspiration?

I do like to go to the seaside on my holidays and stay there for few weeks doing nothing but walking long distances on the beach. That really clears my mind, which is full of the noise I get from various stuff I see and hear every day these days. When I'm not on holiday I listen to music or play and compose music myself for the same reasons. I do like to play video games for both pleasure and inspiration, and of course, I watch all kinds of movies. Inspiration usually comes to me without any particular reason these days and when it does I try to force myself to make time to put it in my work.



ANDRIUS BALCIUNAS

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Interviewed by: Simon Morse

HOW MUCH DID YOU LEARN LAST WEEK?



PETR BALATKA

PRIOR TRAINING: NONE

TIME IN SCHOOL: TWO MONTHS

TOTAL MODELING TIME: ONE WEEK

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the GALLERY

This month we feature: Aleks Kuskov | David Jankes | Andrey Goncharov | Damon Yao
Patrick Evrard | Fabiano Mello de Lima | Jerry Groschke | Giovanni Roschini | Amardeep Awana | Tanoo Choorat

Beast Boy

Tanoo Choorat
rossonerixx@hotmail.com
(Right)



Huloo Huloo

Jerry Groschke
http://www.jerrygroschke.de
Based on a concept design by Faye Hsu
http://fayehsu.blogspot.de/
(Below)



Baba Yaga

Fabiano Mello de Lima

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BATMAN – HIGH TECH SUIT

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治疗室
Treatment Room
隔离室
抽血
体液检验
挂号处
候诊室
急诊室
住院部
门诊部
内科

MEMORY

Damon Yao
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German Soldier

David Jankes
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yeenke@gmail.com
(Above)





Lotus Evrard

Patrick Evrard
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(Top and Bottom Right)



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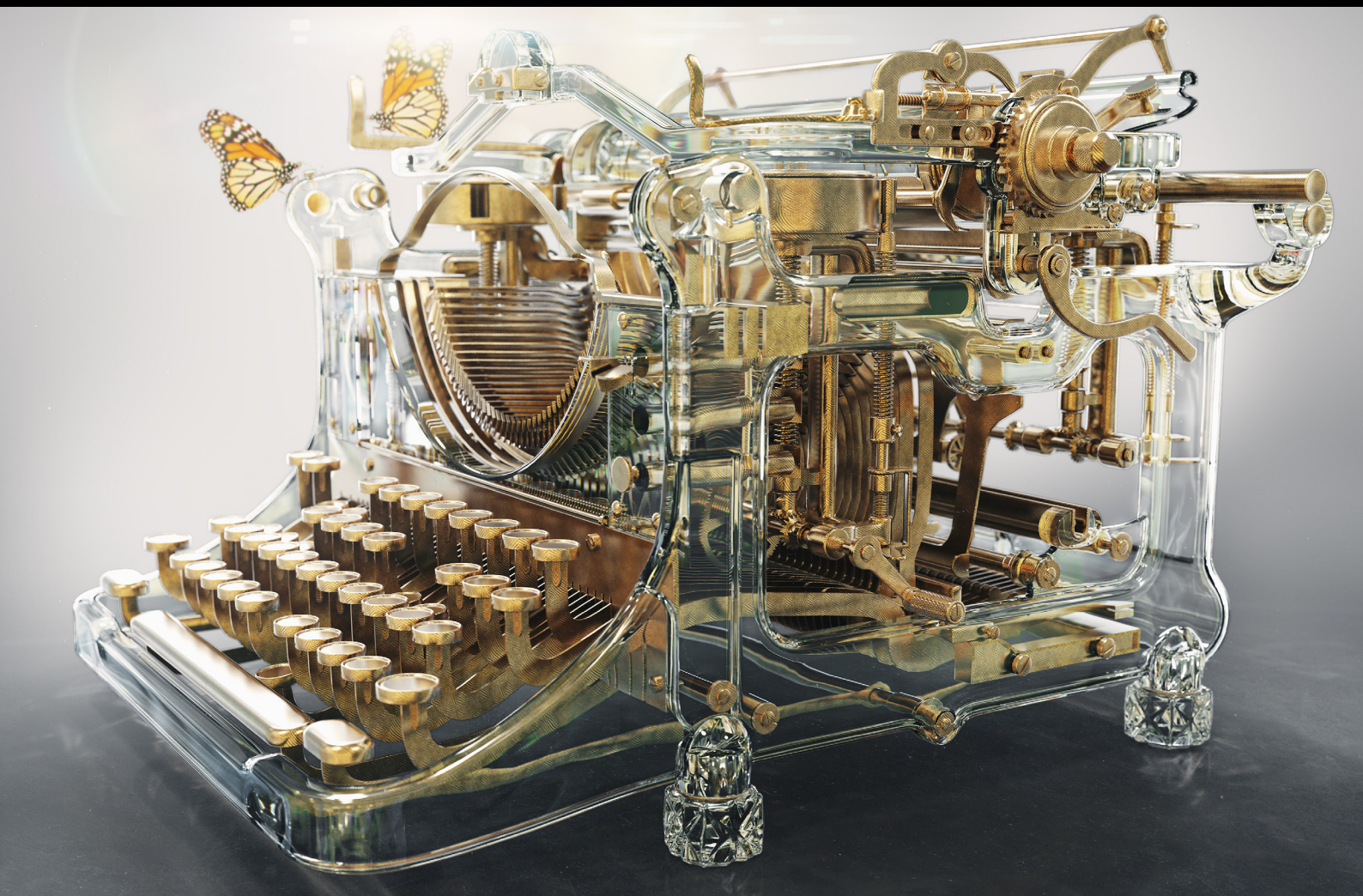
Time Machine

Aleks Kuskov

http://revision.ru/a/AleksCG/

natikks@gmail.com






modo® image by Teodoru Badiu www.theodoru.com
03
Meet modo.
Luxology®

GUIDE TO FX - PARTICLES & DYNAMICS

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3DCreative are branching out from creating stills in this amazing tutorial series, which will be looking at how to set up FX and particle systems in 3ds Max and Maya. Our amazingly talented artists will tackle some of the most common and popular effects, and will show us how to set them up and manipulate them to match an environment of your choice.



3ds max

CHAPTER 06 FLOCKING BIRDS

CHAPTER 06 – FLOCKING BIRDS

Software used: 3ds Max

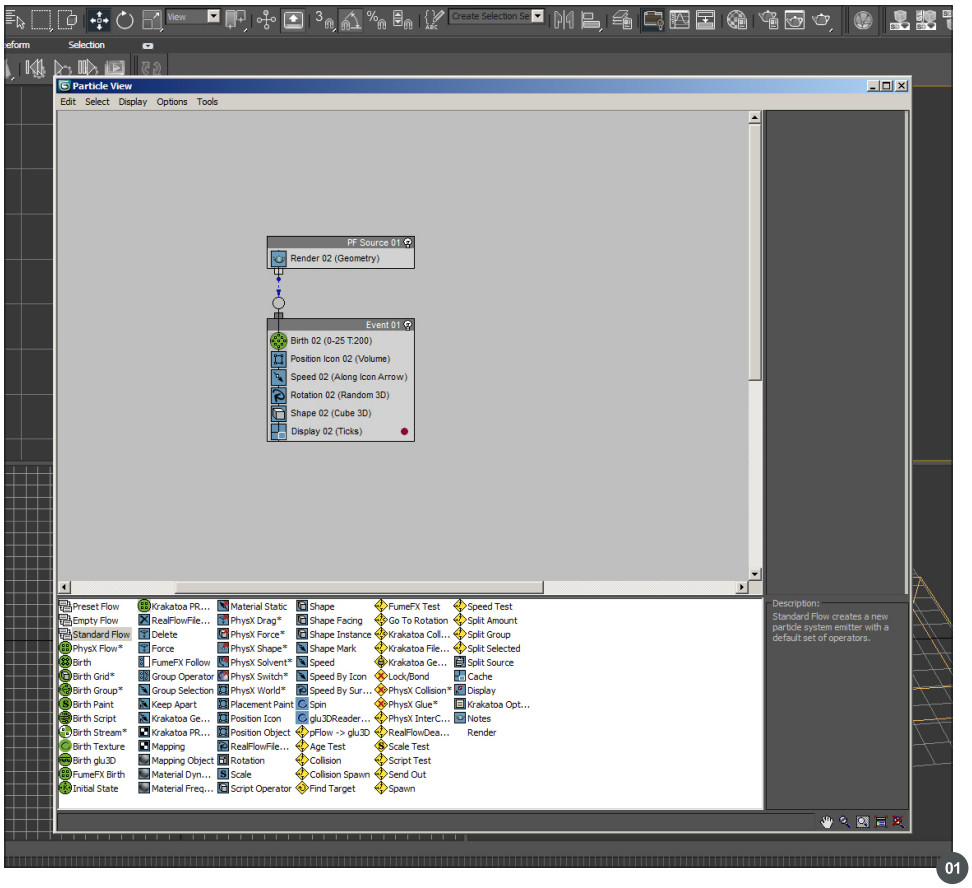
Particles don't have to be literally just particles, such as dust, snow or rain drops. We can instance whatever we like into a particle setup and use simple, out of the box, modifiers to create the behavior/s we need.

Flocking birds or gleaming shoals of fish lend themselves well to particle system behaviors; their complex, turbulent and patterned movements are always an impressive spectacle.

Let's create a simple particle scene setup within 3ds Max that can be adapted and reused for a number of scenarios, such as birds, fish – or in this case – alien crafts!

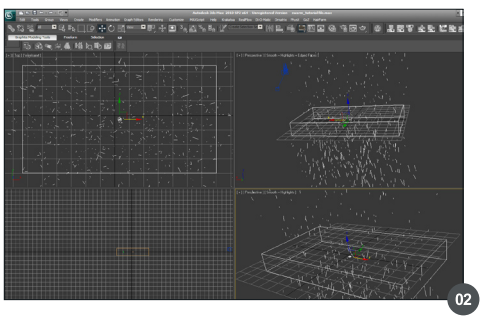
My studio completed some visual effects for a roller coaster commercial earlier in the year and in this tutorial, we will recreate a scene where a large swarm of alien crafts are tumbling and swooping around in the background. We will also look at how easily the instanced geometry can be switched around to use the same setup for birds with animation upon the wings.

Start a new scene within 3ds Max. Hit 6 to open up the Particle View and drag out/create a new Standard Flow particle. You can rename the PFSource if you like. I always like to rename them incase I end up with multiple flows later (**Fig.01**).



01

We will be driving the particle behavior using only some initial speed and space warp values, such as Wind and Internal Turbulence. Delete all the operators within the new flow except for Birth, Position Icon, Speed and the display icon. Switch the display icon type to show Lines. This will make it easier to see the direction, speed and orientation of the particles.


02

In this case, let's emit the particles from a large volume rather than the default icon point setting. Select the Particle Flow icon in the viewport and inspect the revealed parameters in the Modifier tab to the right.

Change Icon Type to Box and adjust the length, width and height values to your liking. In this case, I have set the size to 20 x 40 x 30. You also have some other basic options, such as whether you wish to see the icon in the viewport. I'm leaving it visible for easy/quick selection later if I want to adjust the volume sizes.

If you scrub the timeline you will see some particles being born and emitted within this box volume.

Let's make some quick adjustments to the Birth and Speed operators.

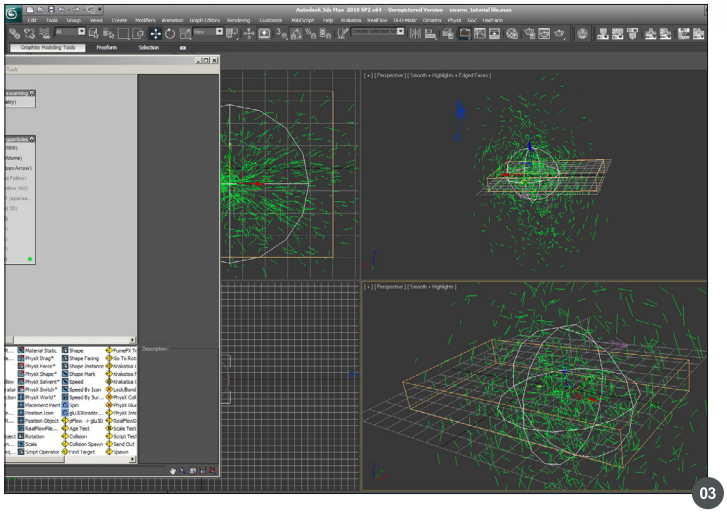
Set the Birth to Emit up to 100 frames and the amount to 2000. We will have 2000 ships or birds swarming around very soon!

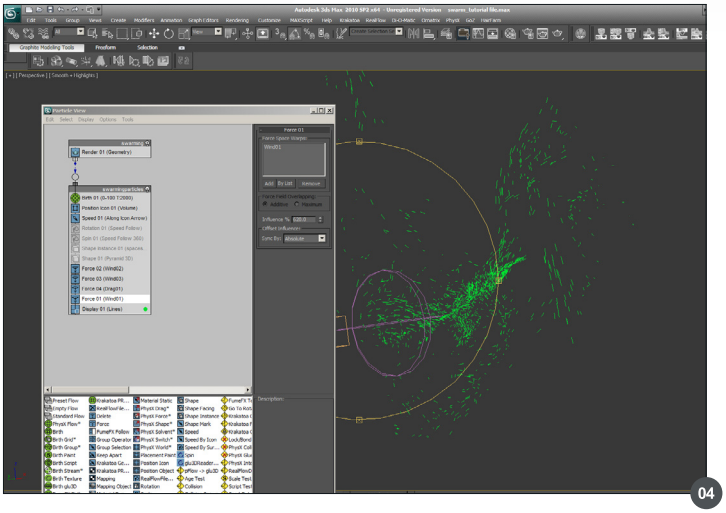
Select the Speed operator and set a speed of around 90 with 180 variation. Set Direction to Along Icon Arrow and Divergence to around 25.

If you scrub the timeline now you will see the particles flying out from all over the box volume with some randomness (**Fig.02**).

Go to Spacewarps and create three Winds, and a Drag. Select the first Wind, set its Strength to -0.25 and change it from a planar to Spherical force. Within the particle flow create a Force operator and add this to the first Wind operator.

We want the particles to stay together and appear to be following along with all the others. By creating a negative wind, particles will be


03


04

drawn toward its spherical centre rather than blown away from it. I've also autokey-framed its overall strength value to change slightly over the course of the scene to add some subtle variation even at this basic first stage (**Fig.03**).

Create three more Force operators within the particle flow. Add the remaining two Wind warps and the Drag to each of the Force operators and set a different Influence value in each. I have set Wind 2's influence to 500, Wind 3's to 620 and the Drag Force Influence to 250. We could add all the Wind and Drag warps to just one single Force operator, but by separating them we can gain finer and further control over the strengths of each effect and balance them individually.

Select the Wind 2 icon in the viewport and enter some parameters for Strength and Turbulence. For Strength I have entered 0.16, with Turbulence, Frequency and Scale at 0.71, 0.13 and 0.05.

Select the last Wind icon and turn the Directional Strength to 0. We will use just the internal turbulence values from this one to influence our particle behavior, so set Turbulence to 1.46, Frequency to 0 and Scale to 0.02. Lastly, select the Drag warp and ensure it is switched on for the duration of your scene. Set Linear Damping to 50 on all three axis.

Scrub the timeline once more to see the particles now twisting, turning and flocking together. Almost all of the Force values can be tweaked or even animated throughout the scene to create unique swarming and flocking behavior (**Fig.04**).

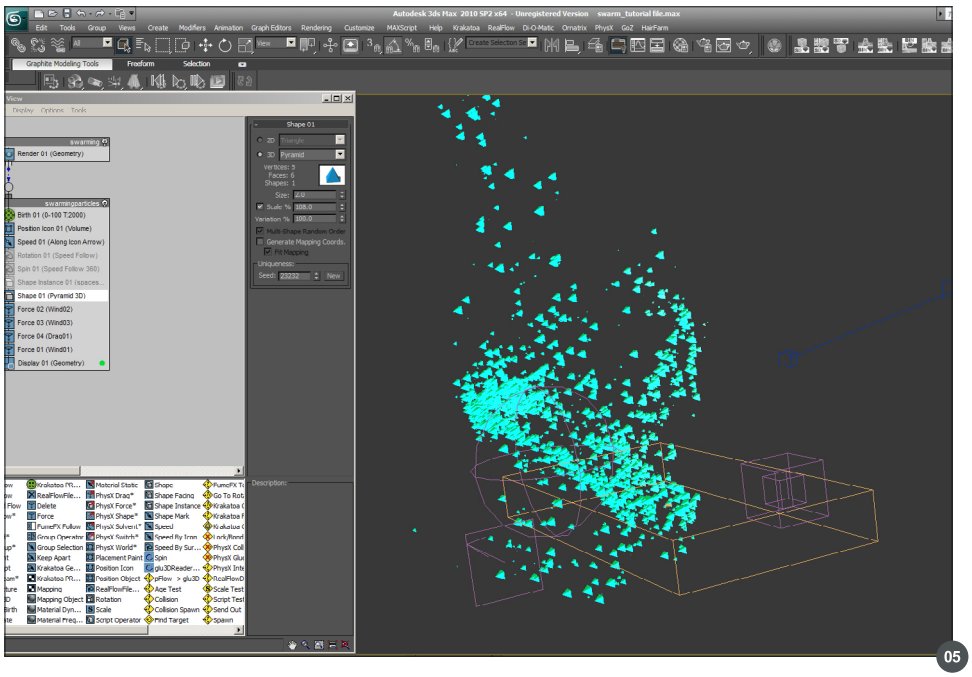
The solid, yet flexible, base of the flocking is now set up and ready for detailing with geometry, such as birds, insects or little spaceships.

Let's visualize the particles as geometry to see them even more clearly. Add a Shape operator to the particle flow and set its shape to 3D pyramid. We will use the arrow-like shape of these pyramids to see if our particles are orientated correctly to the direction they should be traveling in.

Switch the Display icon to show Geometry and scrub the timeline. As we can see, things look a little strange. The same flocking motion is present, but all of the particles are facing in once direction, and not flowing and turning as expected. We need to amend this by adding a rotational value to the particles so they know which way to face and travel (**Fig.05**).

Add a Rotation operator to the particle flow tree and set its Orientation Matrix to Speed Space Follow. Set a value of 90 to the X and Y axis and inspect the playback behavior once more.

We have corrected the direction of the particles so that they travel along the expected axis and orientate correctly to the flow and direction


05



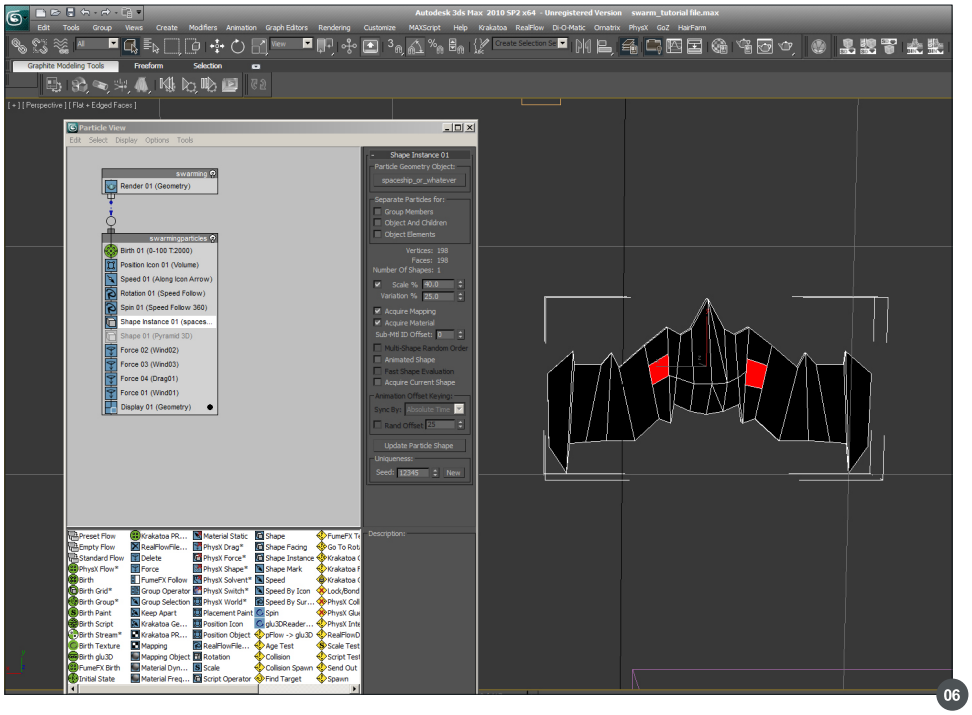
of the flocking pyramids. When you start to instance your own geometry into a system such as this, pay attention to the axis and pivot positions of your custom geometry so you can orientate the Speed Space Follow Axis accordingly.

Lastly, to add even more subtle variation, add a Spin Operator and set the Spin Axis to Speed Space Follow with a value of 1 on the Z axis. As well as twist and turn, the particles will now spin and turn upon their own axis, as if correcting themselves (**Movie 1**).

We can now instance our desired geometry to the particles to finish our effect. In the commercial that a similar scene such as this was created, simple spacecraft-type shapes were created to match a specified design. You can find this shape/model in the finished provided Max scene or create your own.

Add an instance geometry operator to the particle flow tree and place it above the Force operators.

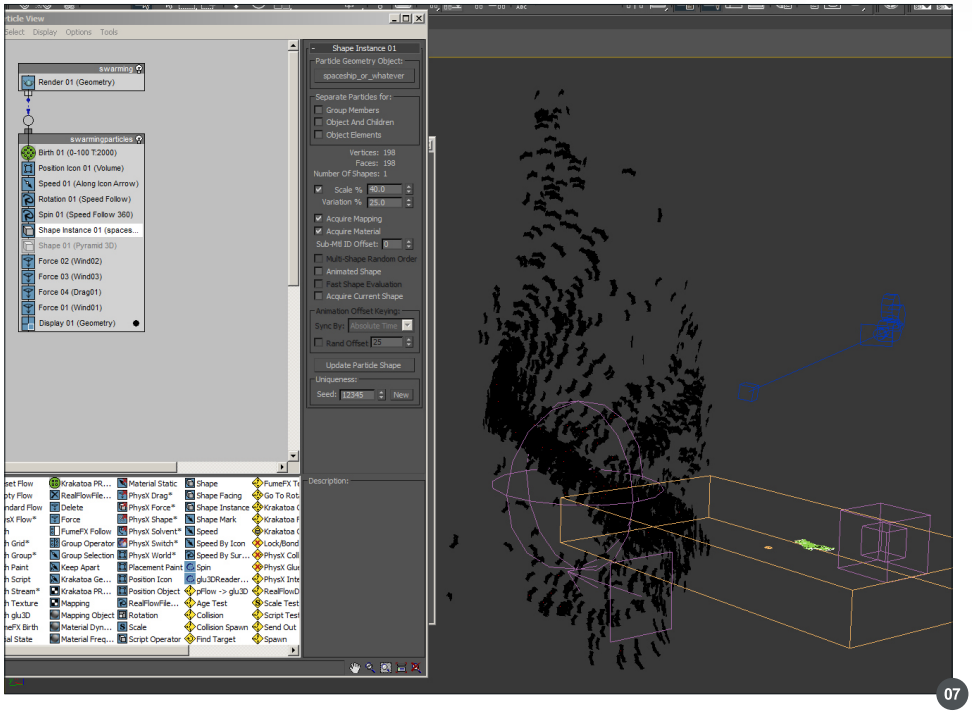
Add the geometry (in this case the spaceship) to the Particle Geometry Object slot and adjust the Scale and Scale Variation. For this example scene, I have set the Scale to 40 and Variation to 25. Variation values would especially add a lot of realism to scenes where the particles are organic creatures such as fish or birds. You can also enable Acquire Mapping and Material here to make sure each particle inherits any textures and shaders from your instanced model. You could also add a Material operator to the particle flow tree, of course, for further control of your particles' appearance (**Fig.06**).





Review the particle setup by scrubbing the timeline or creating a playblast/preview. Keep in mind that the complexity and density of your instanced model will affect the performance and speed of your 3D scene, especially if you decide to create thousands of particles flocking around (**Fig.07**) (**Movie 2**).

From this effective, basic, core setup things can be taken further by adding more events and behaviors to the particle flow, such as Collision events or Particle Age operators that define how each flocking object falls from the sky, explodes or begins a new event. The Instance operator also supports animated and deforming objects/geometry (again, be aware of the scene performance), which is ideal for flapping wings, fish fins or other animated effects.



07

It's always a good idea to cache your particles before committing to rendering and even consider baking them to disk using third party plugins such as Supermesher or Xmesh if you are planning on a huge, geometry-heavy swarm of particles (**Movie 3**).

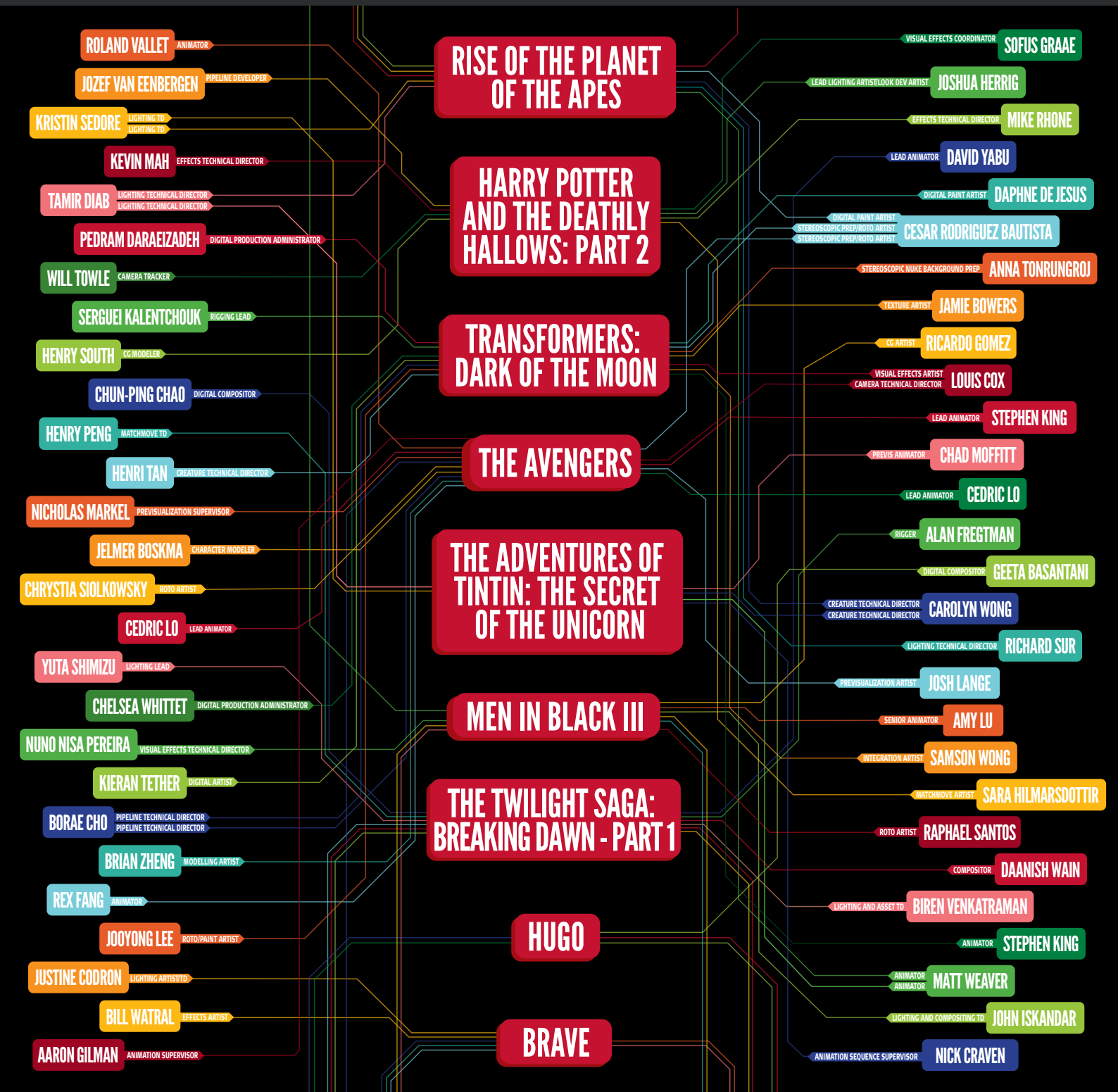
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GUIDE TO FX -

PARTICLES & DYNAMICS

3DCreative are branching out from creating stills in this amazing tutorial series, which will be looking at how to set up FX and particle systems in 3ds Max and Maya. Our amazingly talented artists will tackle some of the most common and popular effects, and will show us how to set them up and manipulate them to match an environment of your choice.

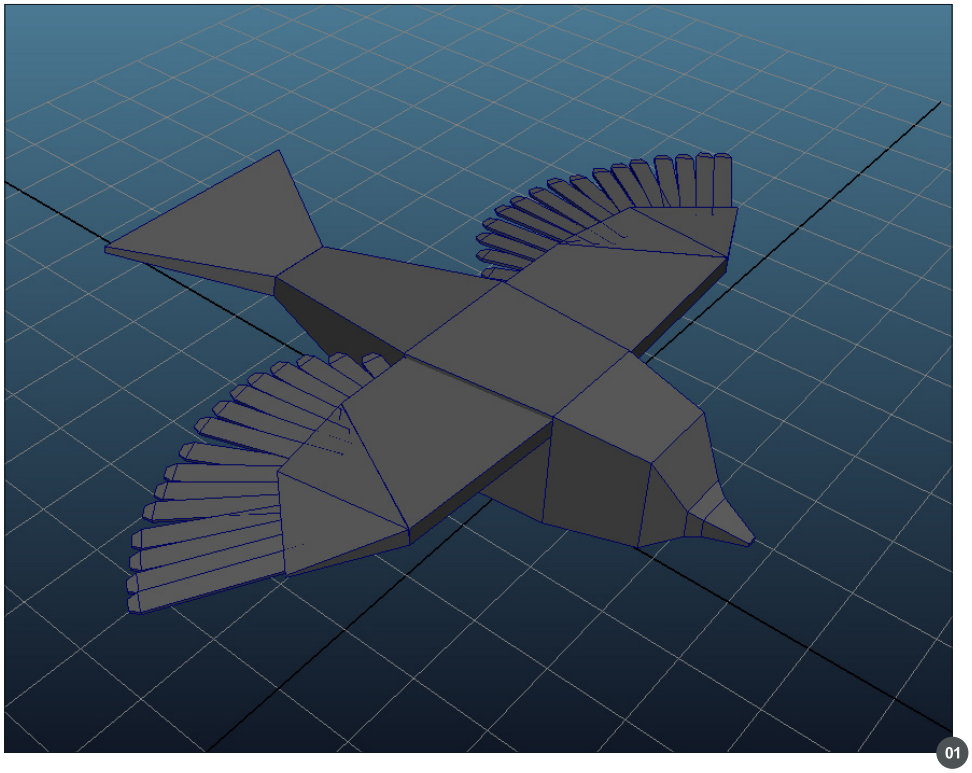


Maya

CHAPTER 06 FLOCKING BIRDS

CHAPTER 06 – FLOCKING BIRDS

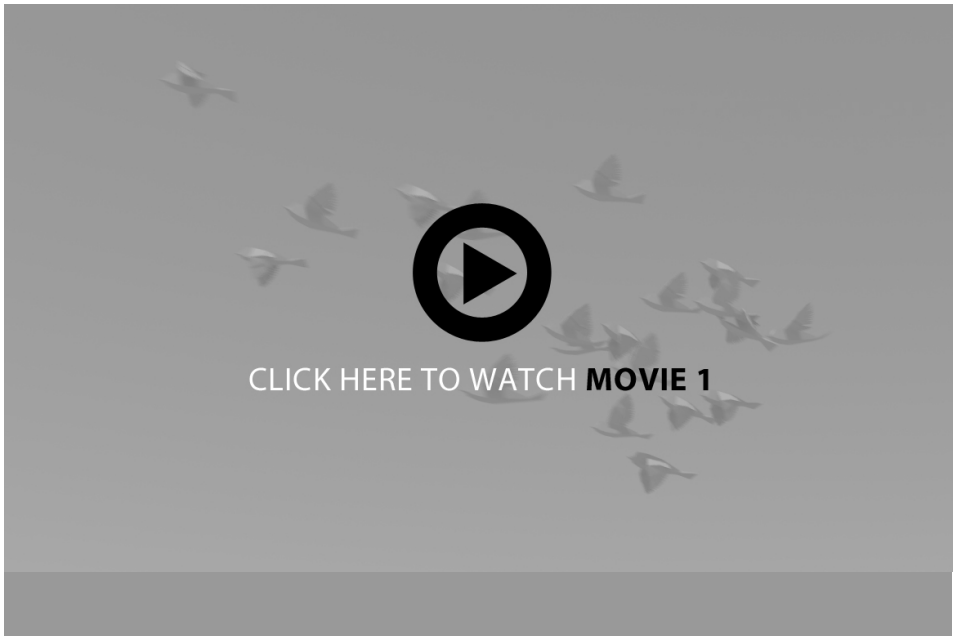
Software used: Maya

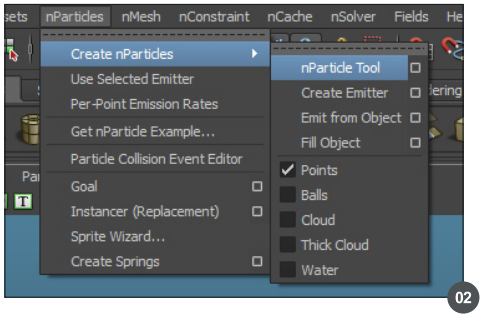


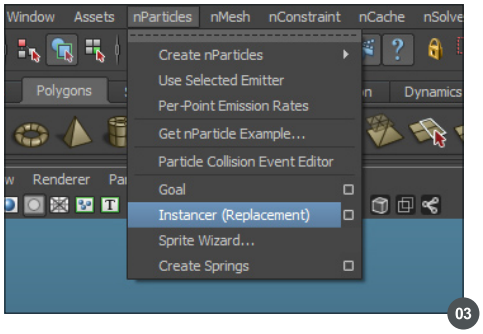
The first thing we need is a bird. We will be using the Particle Instancer to copy the bird to the position of the particles, which means that the positive X axis will be the forward-facing direction for our model. This is so that when we set our particle aim later it will be facing the right direction.

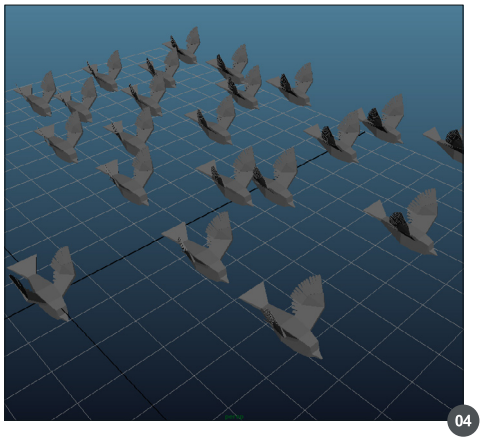
I put together a simple bird, using separate objects that I have adjusted the pivot points of and parented to the appropriate pieces (**Fig.01**).

Then I animate a flying cycle and set the Post- and Pre-Infinity curves to Cycle, so my bird will fly forever (**Movie 1**).







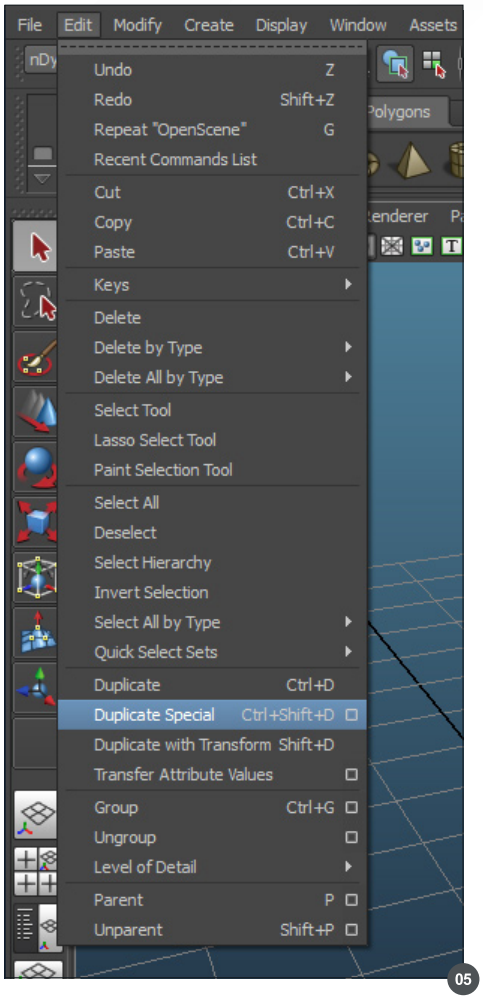


At this point I am done with the bird, so I create a group of all the objects that I can use as the instance for my particles.

Now that we have our bird, we need some particles to give the bird some movement. Using the nParticle tool (**Fig.02**), by default you can click on the grid and place one particle for each click until you hit Enter. You can also go into the options and place a grid or cluster of particles. For now create about 20 particles in random positions and hit Enter. Then select your bird group, shift-select your particles and add an Instancer (**Fig.03**).

The bird should be duplicated to the position of every particle you placed (**Fig.04**).

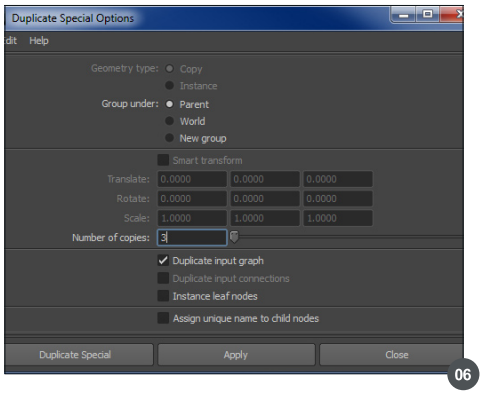
Because we are using nParticles, a nucleus solver is created. By default Gravity will be on, so be sure to set it to 0.



05

If you play your scene, you will have a copy of your bird at each particle position, but they are all moving in sync with each other. Unfortunately Maya does not have an easy way to offset instance animation. What we are going to do is make some copies of the bird and offset the animation, then write a simple expression to set each particle instance to a random bird.

Make sure you have your group selected for your bird. You can click on the bird in the viewport and then press the Up arrow key to get to the group. With your group selected, we need to make a duplicate of the group that includes all the animation keys. This can be found in the Duplicate Special command, under Edit > Duplicate Special (**Fig.05**).



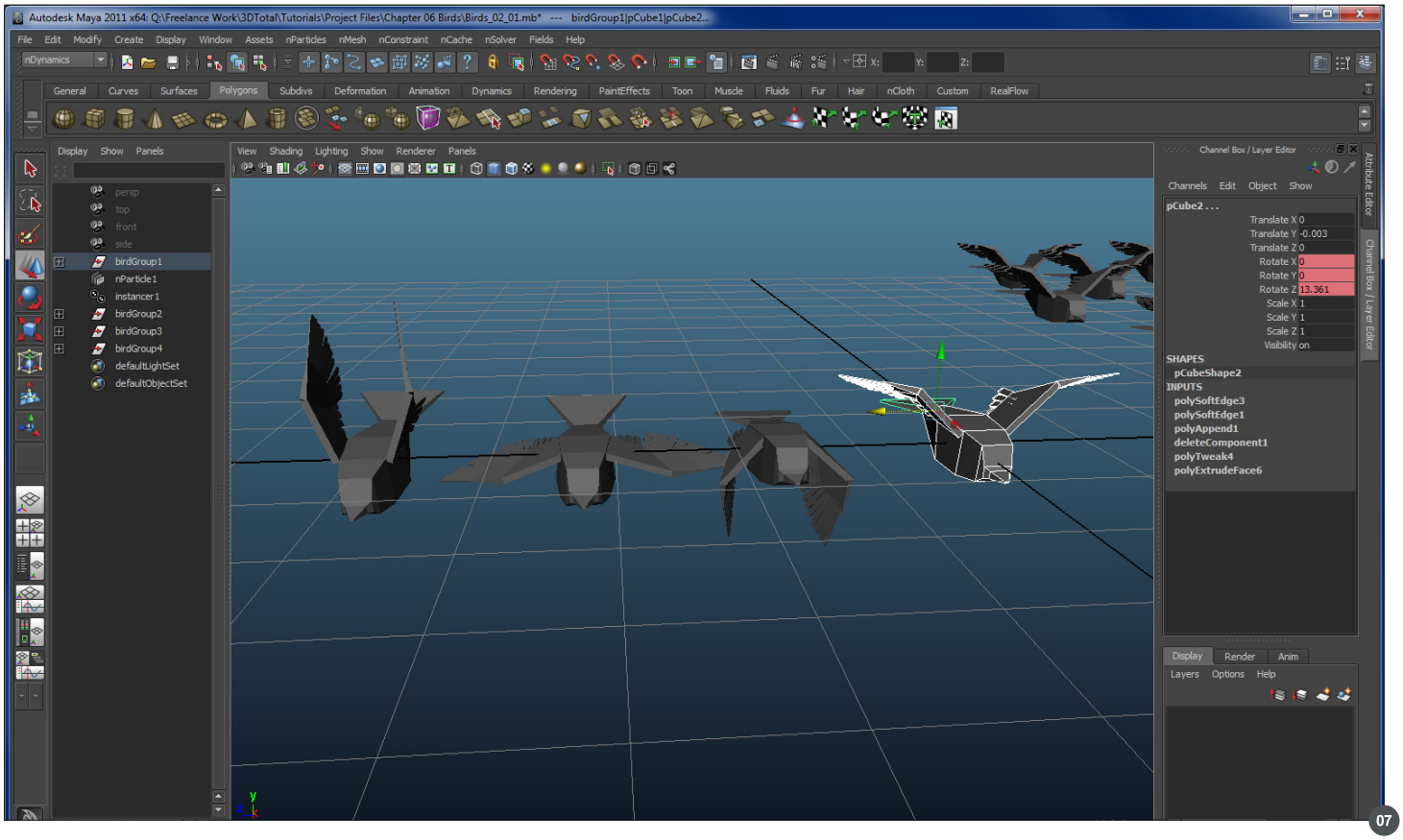
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Go into the options. Check the box that says Duplicate input graph and set the number of copies to three. Then click Duplicate Special (**Fig.06**).

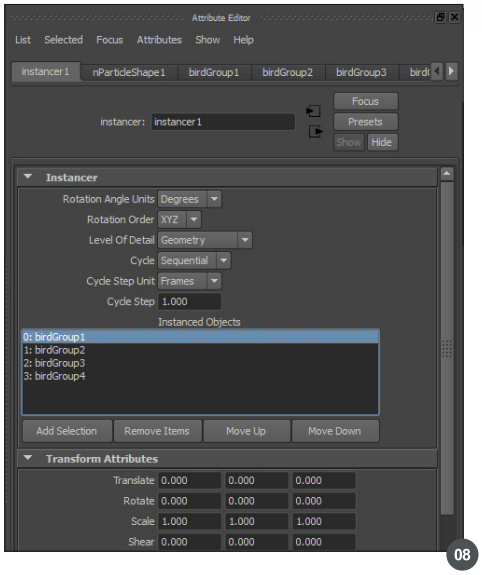
You will now have three new copies of your group with the same animation. Select your groups through the outliner and move them, so they aren't all in the same location. Then by clicking and dragging in the viewport, select each bird one at a time. You can shift the keys in the timeline or the graph editor so that the birds no longer flap their wings in sync (**Fig.07**).

Now select bird groups two, three and four, and then your instancer through the outliner and click Add Selection under the list of instanced objects. Then set the Cycle attribute to Sequential (**Fig.08**).

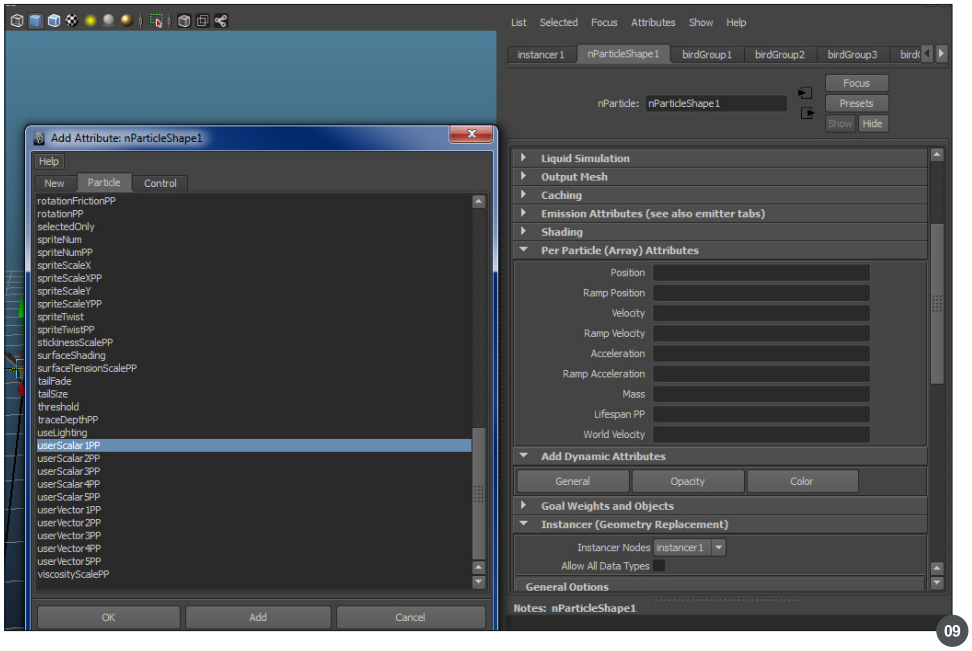
Now each instance will cycle through the four groups, changing every frame. We don't want



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08

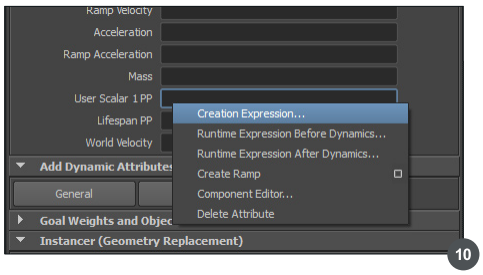


09

each instance to cycle, but by setting it to sequence, it unlocks the Cycle Options in the Instancer Attributes for the nParticleShape. What we want to happen is for each particle to pick one of the four birds at random. To do this we will need to add a custom attribute, so we can assign an expression to generate a random number from 0 to 3 to each instance.

In your nParticleShape, there is a section for Per Particle (Array) Attributes and below it Add Dynamic Attributes. Click on General under Add Dynamic Attributes and in the window that pops up, go to the Particle tab and scroll to the bottom and you will find "userScalar1PP" (**Fig.09**).

This is an attribute that holds a single value and works on a Per Particle basis. Select it and hit OK. It will show up in the list of Per Particle (Array) Attributes. Right-click on the box to the right of User Scalar 1 PP and select Creation Expression (**Fig.10**).

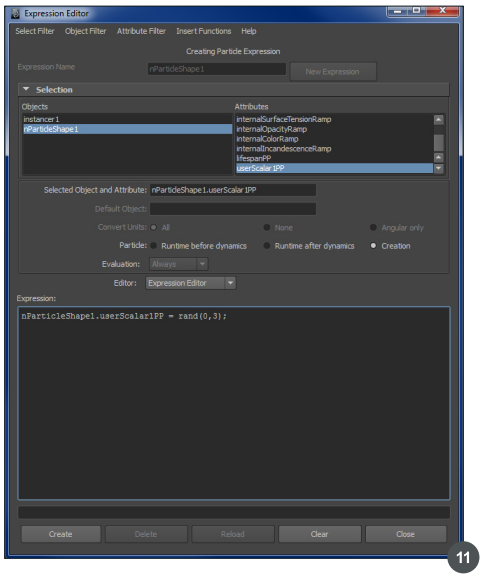


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Then add "nParticleShape1.userScalar1PP = rand (0, 3);" to the Expression editor and click Create (**Fig.11**).

Now our userScalar1PP value will be set to a random number when a particle is created and store a different value for each particle. We can now set the Cycle Options > Age to userScalar1PP and each particle will have a random bird from the set.

The reason we set Age instead of Cycle Start Object is because throughout the life of the particle it cycles through each of the four birds. So if we set the age to be a constant random value, each particle will stay at one of the birds and not cycle (**Movie 2**).



11



Now that the birds look the part, we want them to move around as well. To do this we are going to set a goal for the particles, so they all move in the same general direction and appear to be

flocking. We will use another particle system as the goal, so each instance will head for a different particle and the behavior can be controlled by the spread of the goal particles. When I use an nParticle system as the goal for another nParticle system, I usually run into problems. Either the goal won't work or the particle life settings stop working. As a result, in this case I am going to use a standard particle system as the goal for my birds.

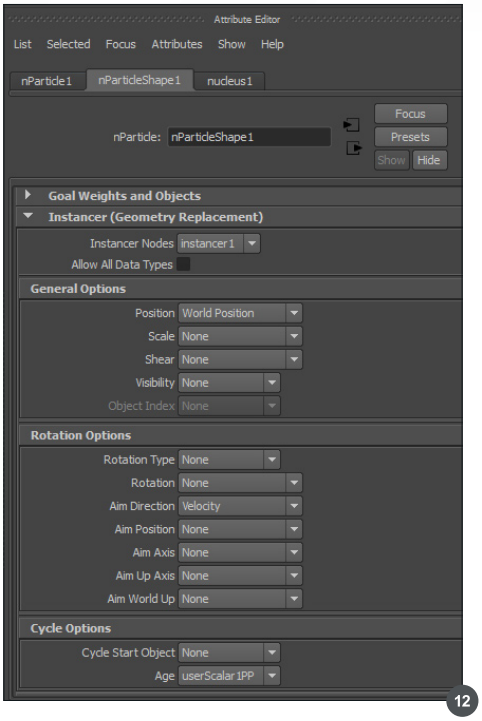
Switch back to the standard Dynamics module and create a particle emitter. Set Rate to 50, Minimum Distance to 5 and Max Distance to 10. Then under the particle Shape, set Lifespan Mode to Constant and Lifespan to .5.

At this point, select your nParticle with the birds first, then Shift + select the particles that will be the goal and in the Particles menu, select Goal. If you play back the scene, your birds should be flying all over the place trying to get to the goal particles. Chances are the default settings make the birds move a bit too fast and they also do not rotate to face the direction they are moving.

In your nParticleShape attributes there is a section for Goal Weights and Objects, and another for Dynamic Properties. Set the Goal Smoothness to 6 and under Dynamic Properties set Conserve to .8.

You can adjust the settings to get a different behavior from the birds. Then in the Instancer options, where we set the Cycle Options before, set the Aim Direction to Velocity (**Fig.12**). This will make the birds point in the direction they are traveling, as long as you made sure the original model was facing along positive X.

Add some animation to your goal emitter to get the birds to move across your scene, instead of just swarming in one spot (**Movie 3**). All of the birds will be flying at roughly the same speed. You can change that by adding a creation expression to the Goal PP attribute, like we did for the userScalar1PP. Just add "nParticleShape1.goalPP = rand (.85, 1)" to the creation expression (**Fig.13**) (**Movie 4**).

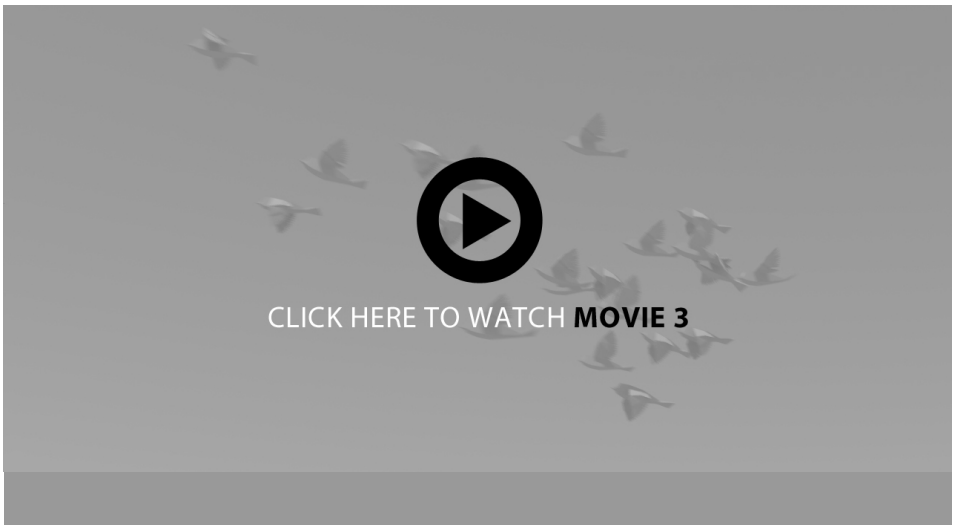


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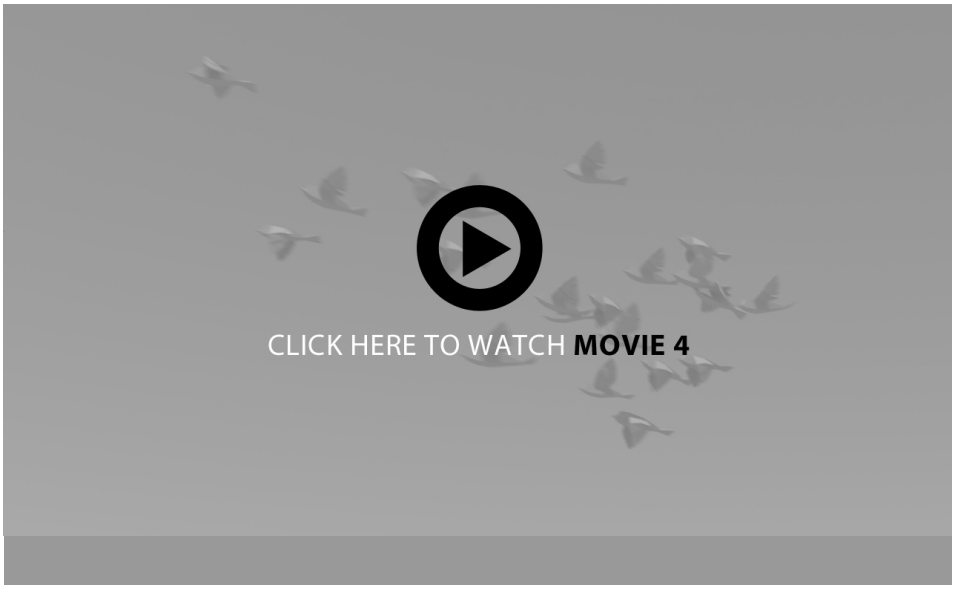
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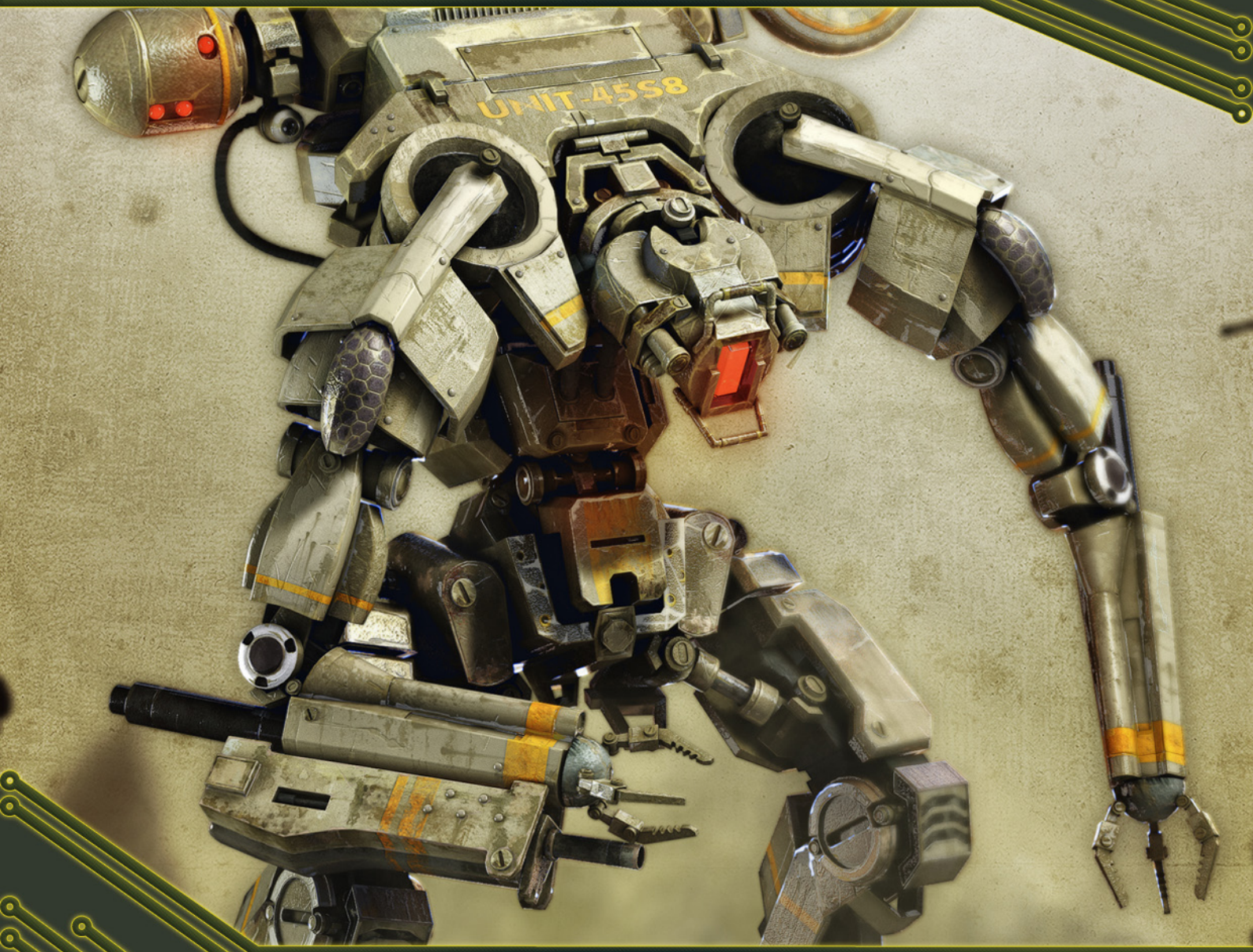
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BUILDING DROIDS



Characters are, of course, a popular subject for CG artists. However in this series we will be approaching creating characters in a slightly different way. Each of our amazingly talented artists will be provided with a 2D concept and technical drawing of a cool, sci-fi droid. They will then show us how to turn this 2D information into an accurate and exciting 3D model. Many techniques and approaches will be used throughout the series, which will provide all of us with a great opportunity to develop our own 3D skills.

RECON DROID

CHAPTER 06 – RECON DROID

Software used: 3ds Max

This tutorial is based on a concept by Alexander Inglesias called *Recon Droid* (**Fig.01**), and is going to show you how I approach a 2D concept and transform it into a 3D model. You can also see the way Alexander built his concept in the *2DArtist* magazine issue #74.

For this process I'm using 3ds Max 2012 for modeling, Photoshop CS4 for textures and compositing and V-Ray 2.0 for rendering.

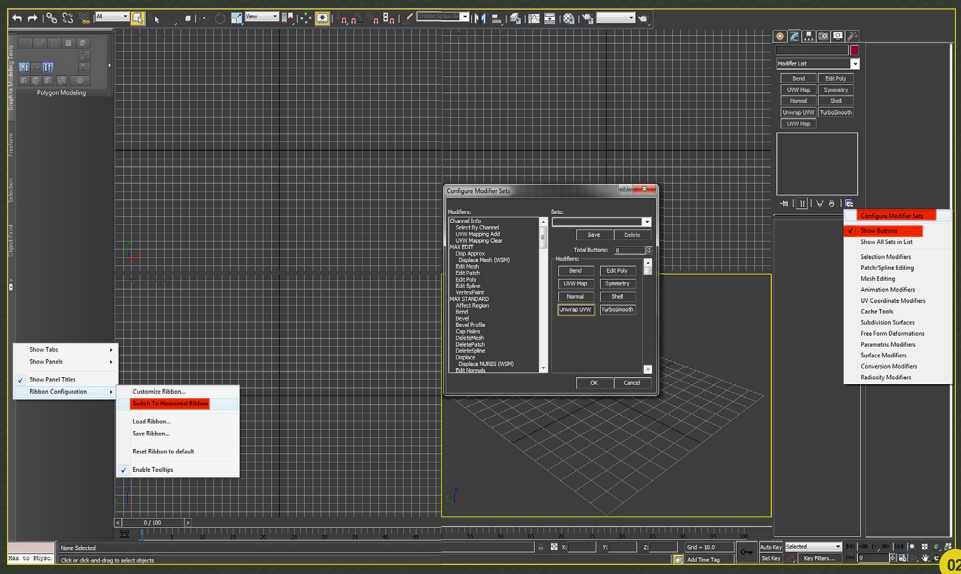
To start I would like to take a moment and show you a few things I do before I start a project, such as customizing 3ds Max's interface. It's always good to have all the necessary tools ready to use. This will save you a lot of time along the process.

Firstly I like to move my Ribbon on the side, by right-clicking on the Ribbon > Ribbon Configuration, then choosing Switch To Horizontal Ribbon (**Fig.02**). Also I like to get the modifiers that I mostly use into the Modifier Set panel. For this, go to the Configure Modifier Sets button, choose Show Buttons and then Configure Modifier Sets.

From here I add eight buttons with the ones that I use most: Edit Poly, Turbosmooth, Symmetry, Shell, Normal, Bend, UVW Map and Unwrap UVW. You can also go on and change some of the shortcuts from Customize User Interface, but if you know the standard ones it will be all right and save you a lot of time while modeling.

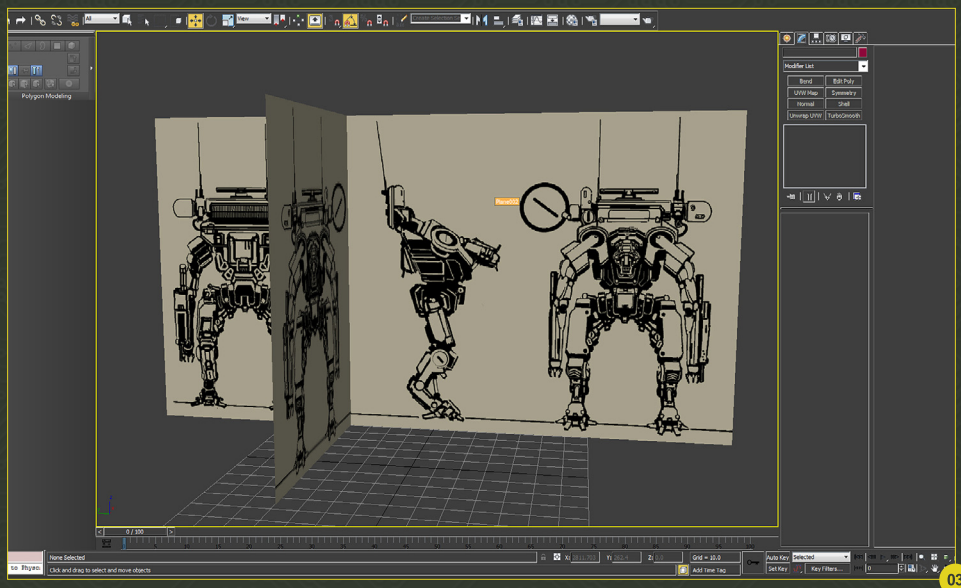


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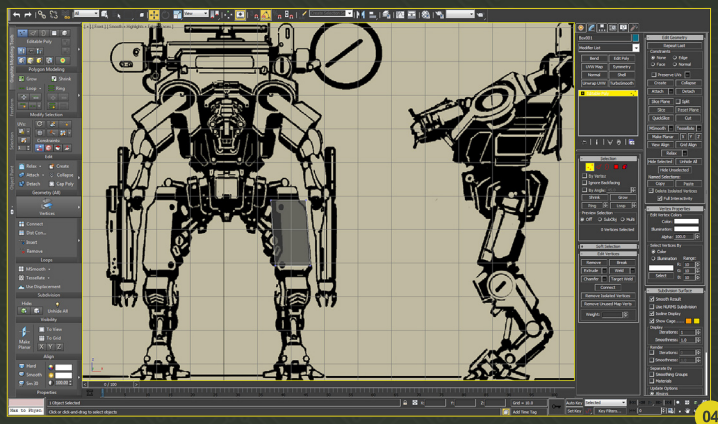
I'm going to start the model by building a base mesh (or white box) to get all the shapes in place as soon as possible. This will show you if the proportions work and you can tweak the silhouette before you get into modeling details, which would make it much harder.

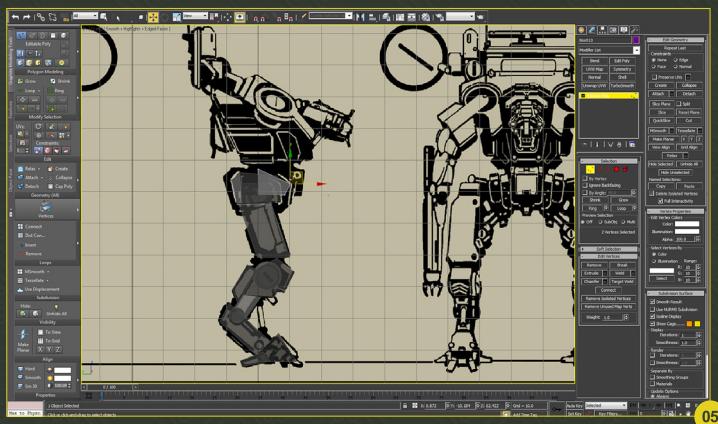


03

First I bring in the blueprint supplied and apply it to a plane (**Fig.03**). I'm careful to match the plane size to the image dimension, just to be sure I'm getting close enough to the original proportions of the blueprint. So in this case my image is 2647 x 1443 and my plane will be 264.7 x 144.3 cm. Once the proportions are set you can scale it up or down to match it to whatever world scale you might want.

I'm starting to model the base mesh from a primitive cube, and I'm starting this one from the legs up. There is no rule to this; you can start from the place you feel more comfortable with.

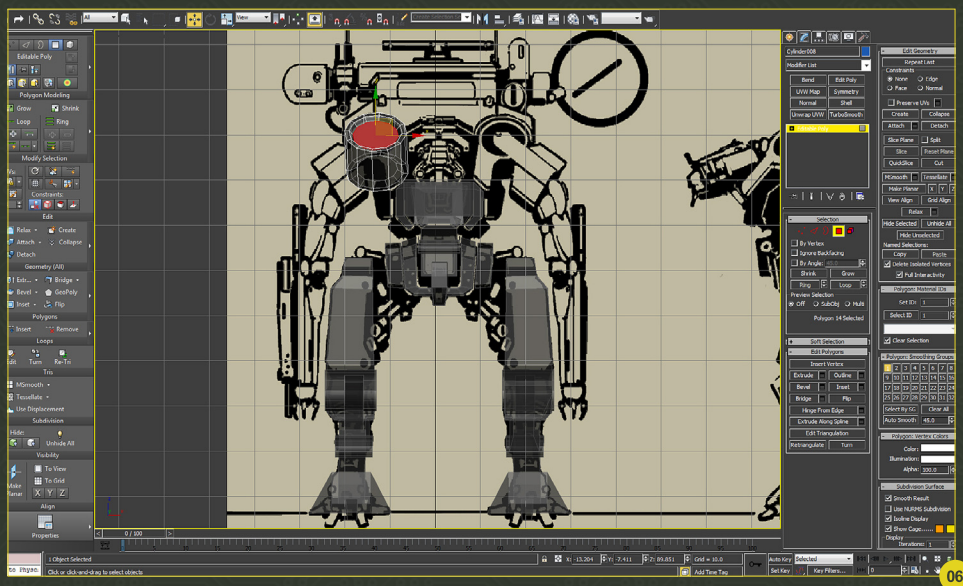




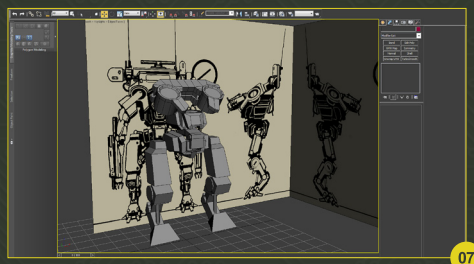
I'm pressing Alt + X to make it transparent, so I can constantly check the shape on the blueprint (**Fig.04**).

I convert the cube to an editable poly and start to move the vertices along the shape. I'm adding more and more boxes for each of the big elements that form the droid (**Fig.05**), but not getting into much detail with any of it for now. You just want to get the basic shape for now. Don't forget to check your mesh from all the angles: front, sides, top and bottom. You can tweak it later on, but it's better to get it close to the reference from the beginning.

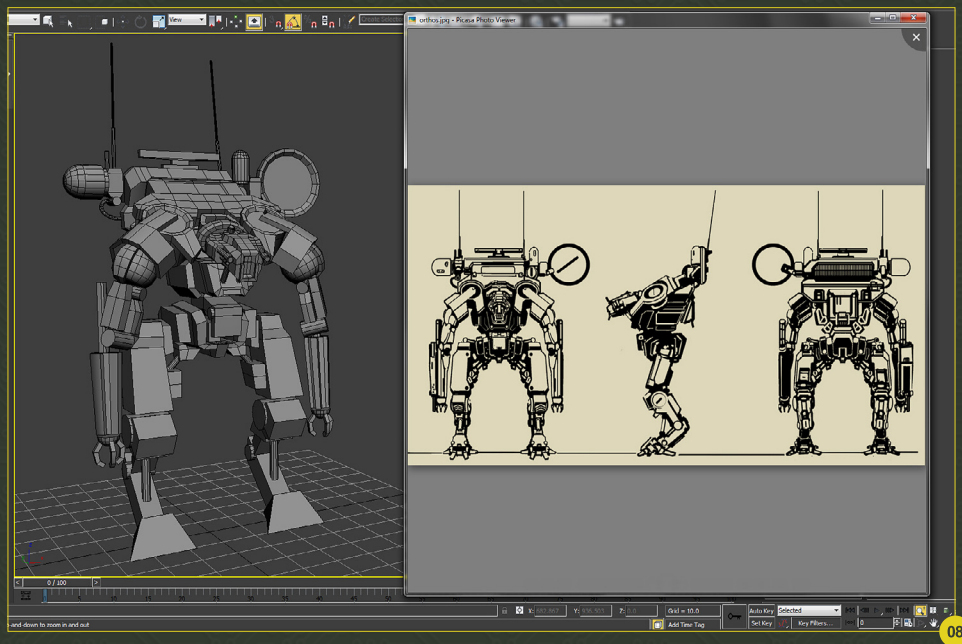
For more complex parts, like the shoulders, I'm going to do a few extrudes, just to get familiar with the shapes. In this case I'm starting from a cylinder that I convert to an editable poly. I select the top and bottom faces, do an insert first and then extrude inwards (**Fig.06**).



For shapes that look unfamiliar or you've never modeled before, it's good to get in and do a few extrudes, even at the base mesh stage, just to learn them, so that once you go into the high poly modeling you know what to expect.

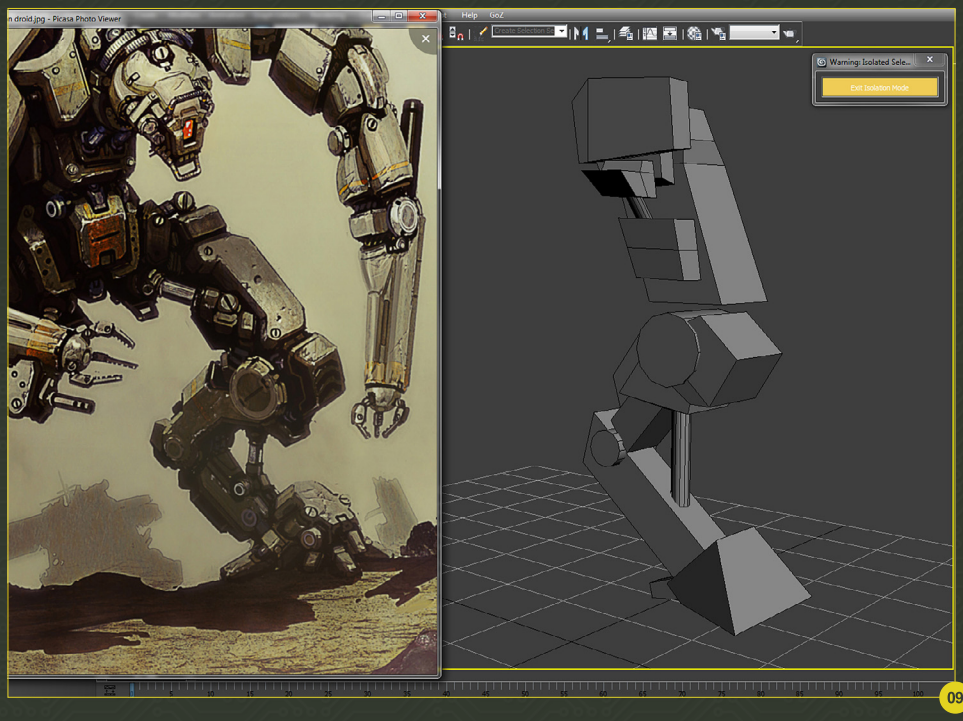


Once I have a few shapes done I use the Symmetry modifier to get the shape of the entire model on the screen (**Fig.07**). You may have already noticed I'm building one element at a time, and wherever I have a symmetrical part I'm only modeling it once and then mirroring it to the other side.



After I get the white box done (**Fig.08**) I check to see if the silhouette works. Sometimes when you follow the blueprint too closely from the orthographic views, your model might end up looking a bit weird in Perspective mode, so this would be a good time to check for this and tweak it.

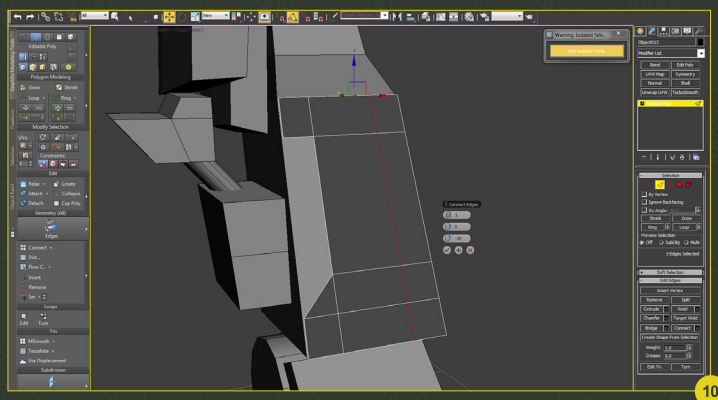
I'm now ready to start the proper modeling process, and I'm going to do it like I did with the base mesh: one element at a time, starting with the leg (**Fig.09**). I first go into Isolation mode, by pressing Alt + Q, with the focus on the leg. I now get out the final concept as a reference; as I already have the big shape done, I'm going to focus on more detailed forms.

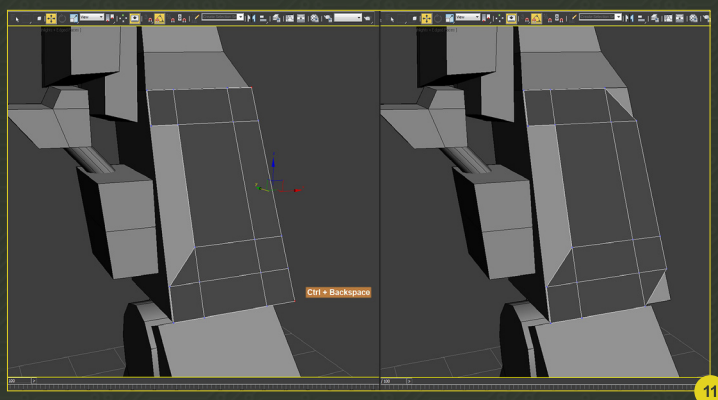


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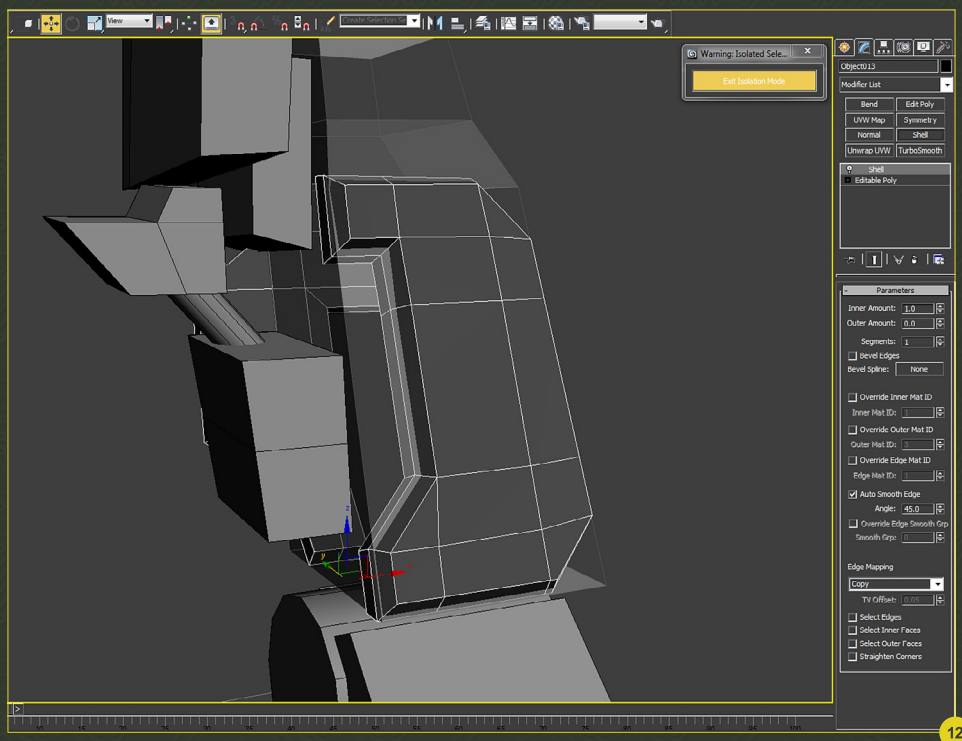
This time I start by copying the front face of the hip onto a separate object and then start connecting the edges whilst having the final shape in mind (**Fig.10**). I also use the Cut tool to cut along the shape.

I'm deleting the side faces where I don't need them. Also, by using Ctrl + Backspace, I'm removing the corner vertices without deleting the polygons (**Fig.11**).


10



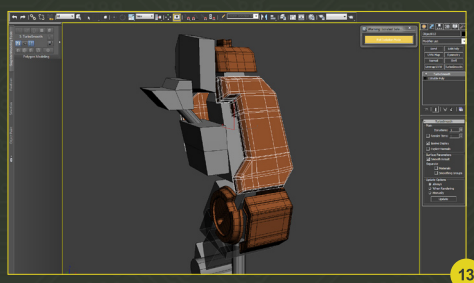
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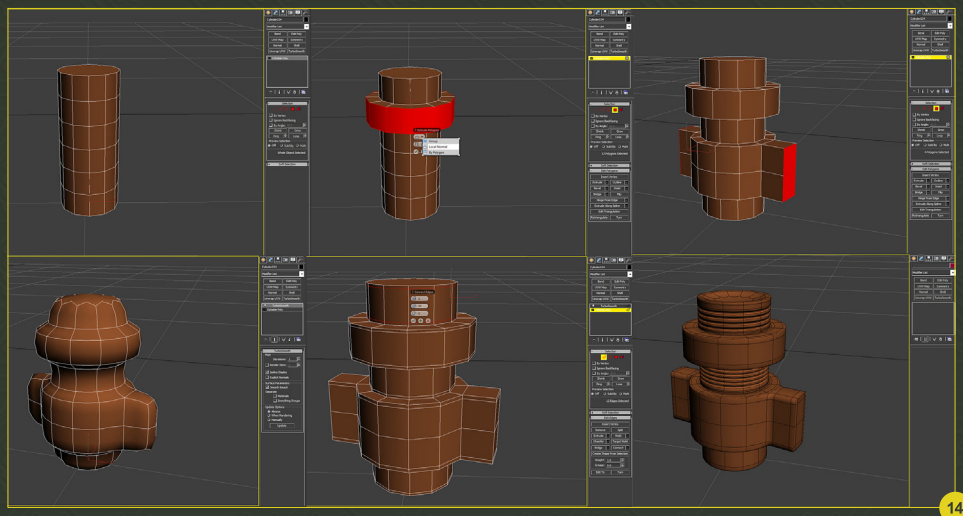
I'm going to extrude the edges all around the hip base mesh by holding the Shift key and dragging them along the axis. Once I have got the right shape, I add a Shell modifier on top to get the right thickness (**Fig.12**).

I can convert the mesh into an editable poly now, so I can do some more cuts. First I add the Turbosmooth modifier on top, to see how the shape will deform once it's smooth, and then I reinforce the sides and the edges that need to stay hard, by chamfering them (**Fig.13**).


13

I'm going to do some of the smaller parts, so that I can reuse them all across the model. I start with a screw that goes into the knee.

I start fresh with a cylinder that comes with five horizontal loops. I convert it to an editable poly and then select the second row from the top, by selecting one face and holding down Shift and selecting the next face in the row. This will make a loop selection in Polygon mode. I extrude the row and choose the Local Normal option in the Extrude stack (**Fig.14**).


14

I repeat this process for the next two rows, leaving one row in between, then I select just two faces and do another extrude.

I'm adding the Turbosmooth modifier on top to see how the shape will change once it's smooth. You can see in the image that it has lost the right definition, so it's time to reinforce some of the edges to keep it hard-edged.

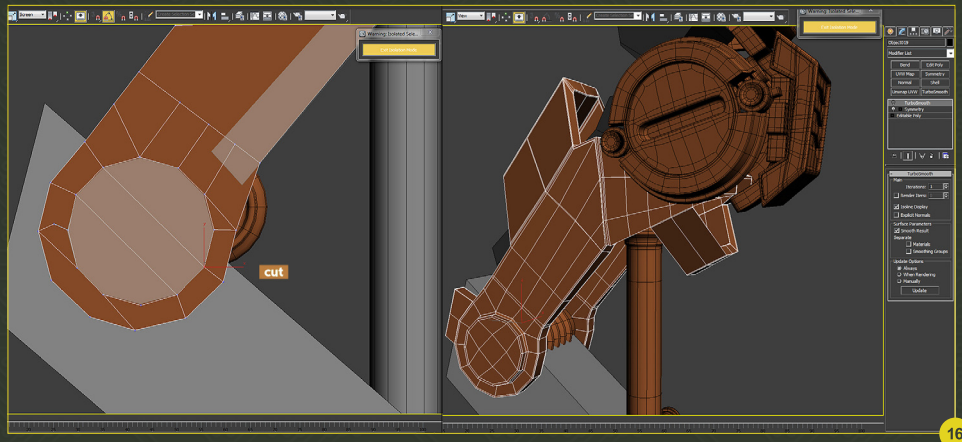

15

You can do this by chamfering some of the edges, as I have already explained, or in this case I'm going to select a ring of edges – select an edge and press Alt + R – and press Connect Edges. Set the number of edges to connect to 2 and increase the spacing between them to around 82 or sometimes 90, depending on the height of the shape. The closer to the extremities you get with the reinforcement, the sharper that edge will be once it's smooth.

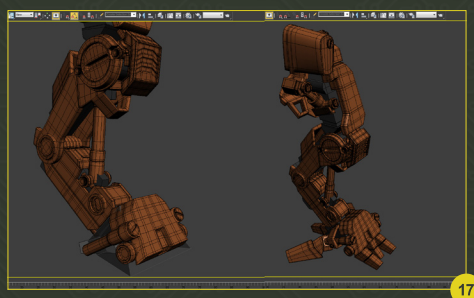
To make it look like a screw it needs a few indents, so I'm using connect edges to add a few more loops, spaced evenly this time. I select the even-spaced edges and extrude the edges with a negative height, something like -0.02 and a similar width of 0.02. This will keep the edges pretty close together, so they will stay hard enough. It's good to get a collection of these kind of parts done before getting further, so you could just copy them in the places you need them (**Fig.15**).

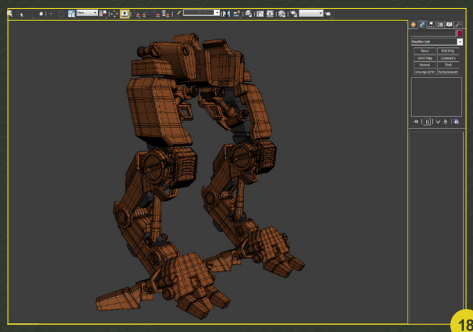
For the next part of the leg I'm going to use the same method by copying a side face from the base mesh, and starting to cut the shape in it by using the Cut tool (**Fig.16**). This time it is a circle, so I cut and move the vertices in place to get the circle shape.

I continue to repeat those processes until I get the entire leg done (**Fig.17**). Some shapes need more edges and some need less. It's good not to add excess edges if you don't need them, because it will slow down your computer once you get to a higher poly count and with too many unnecessary polys it will slow down the animator who will need to work their animation on a mesh.



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Once the leg is done, I mirror it across the X axis to see how they look and if they match the white box silhouette (**Fig.18**).

I'm now going to use the same methods to build the arm (**Fig.19**). I do the extremities first, as they are going to be mirrored, so I try to cover as much of the white box space as possible.

For the forearm I'm going to use a slightly different approach. I start by using a copy of the base mesh this time, which you can see in section A of **Fig.20**.

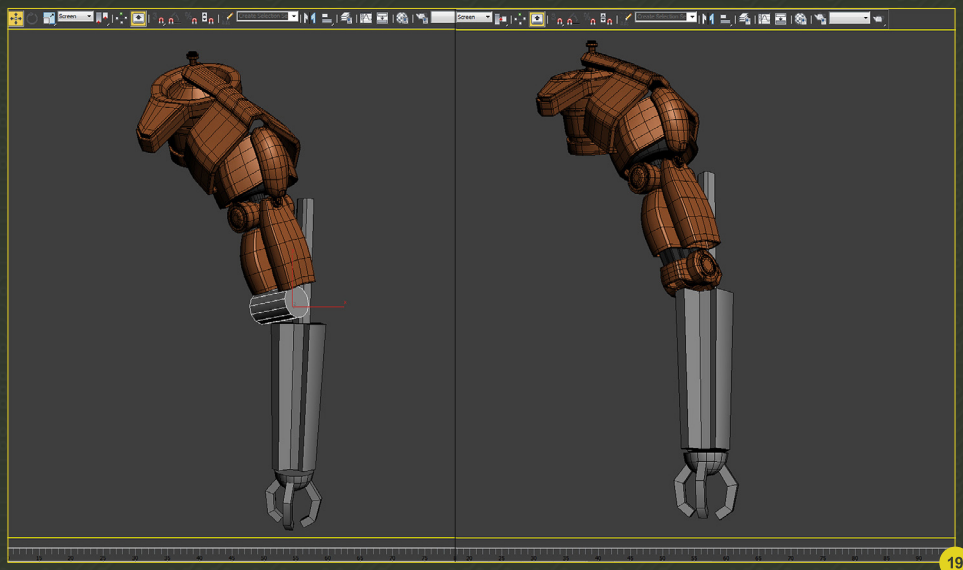
In section B, I add an edge loop around the top quarter of the shape, trying to match the concept, and delete two of the faces on each side (demonstrated in section C).

I extrude the edge at the top of the hole and weld the inner vertices (illustrated in section D). Then I select two edges of the remaining hole (as seen in sections E and F), and use the Cap Hole button in the Ribbon to cap the hole.

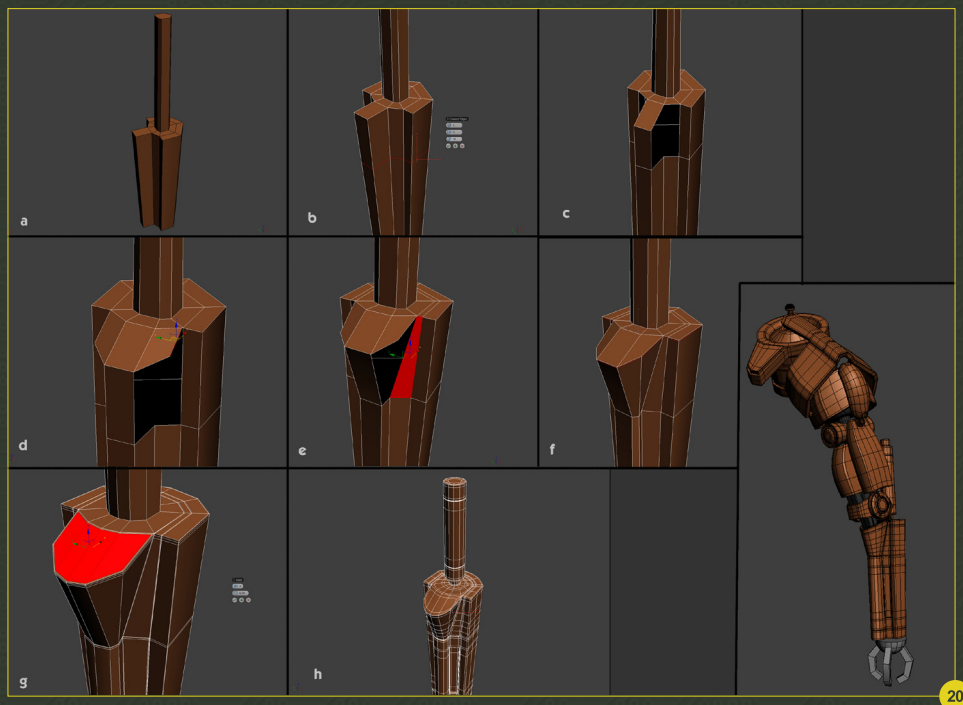
I'm going to reinforce the edges like before now, but this time I'm also going to use the Insert Poly tool next to the usual Connect Edges; shown in section G. I can put the Turbosmooth modifier on top now and check if I did a good job with the hard edges. Now I have a rounded, but still hard-edged shape on the forearm (illustrated in section H).

Using the same technics I'm beginning to finish the Droid arm. You can see I don't need to use too many edge loops to reinforce the hard edges in this (**Fig.21**).

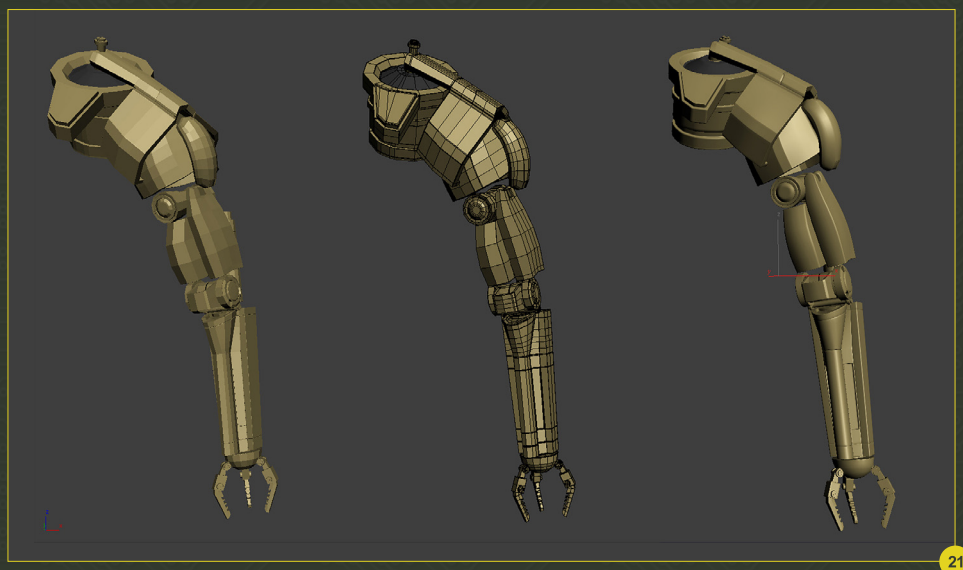
For the radiator on top of his back I'm using a slightly different method. I copy a face, again,



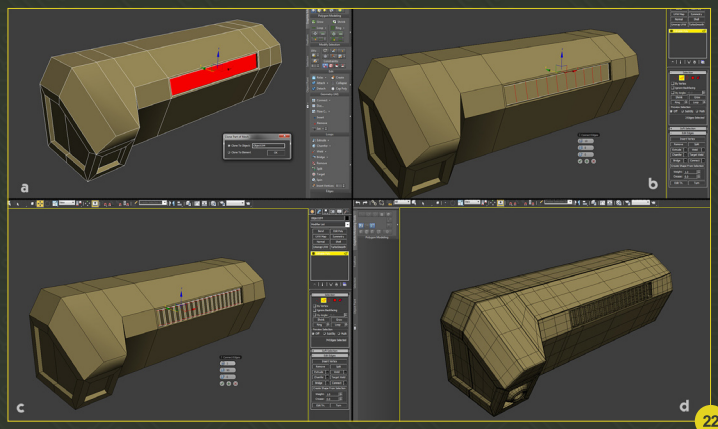
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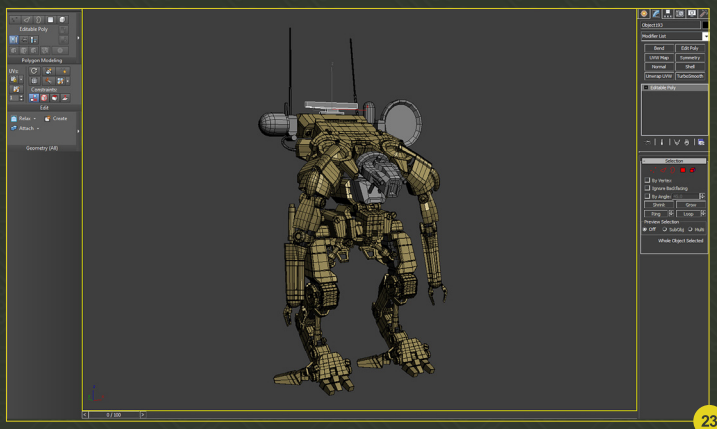
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from the place I will need the radiator elements to go in, which you can see in **Fig.22** section A.

Similar to the way I did the screw, I connect edges at equal intervals, let's say 10 edges this time, as illustrated in section B. I extrude all those edges and then do a chamfer at the end of the extruded ones. You can get to the same result by dividing the initial plane into 20 faces and extruding each other one with the same amount.

Next I connect the extremities of the shape with reinforcement edges, which you can see in section C. Then I scale the shape up a bit and position it in the radiator cavity, put the Turbosmooth on and there you have the finished piece in section D.

I'm now mirroring the symmetrical elements and getting to the remaining shapes of the droid (**Fig.23**). I'm going to apply the same principles for all the remaining parts.

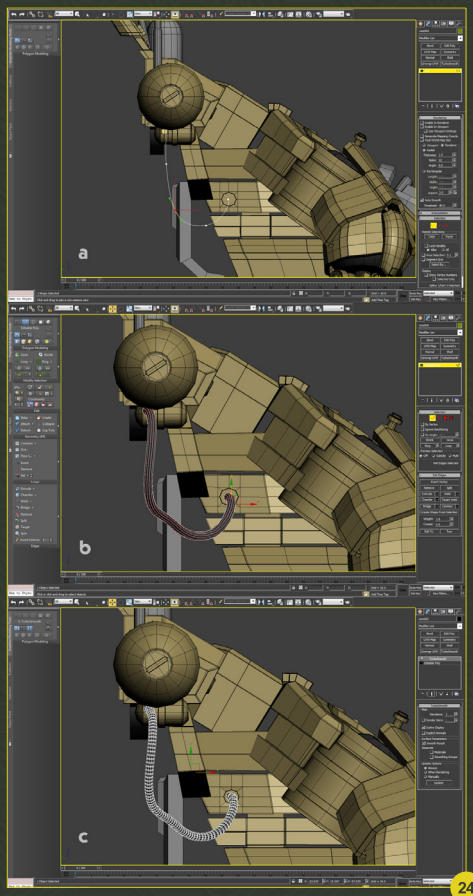
This droid doesn't seem to have too many cables like the usual robots tend to have, but there is still one visible in the concept. I'm going to use the primitive shapes in 3ds Max to create this one. I use the line to create the cable and manipulate the points to get it into a natural flowing shape, as demonstrated in section A of **Fig.24**.

As soon as I establish the tight shape I convert the line into an editable poly. If the line doesn't seem to have enough edge loops, I can add a few more to keep a good flow and roundness to it.

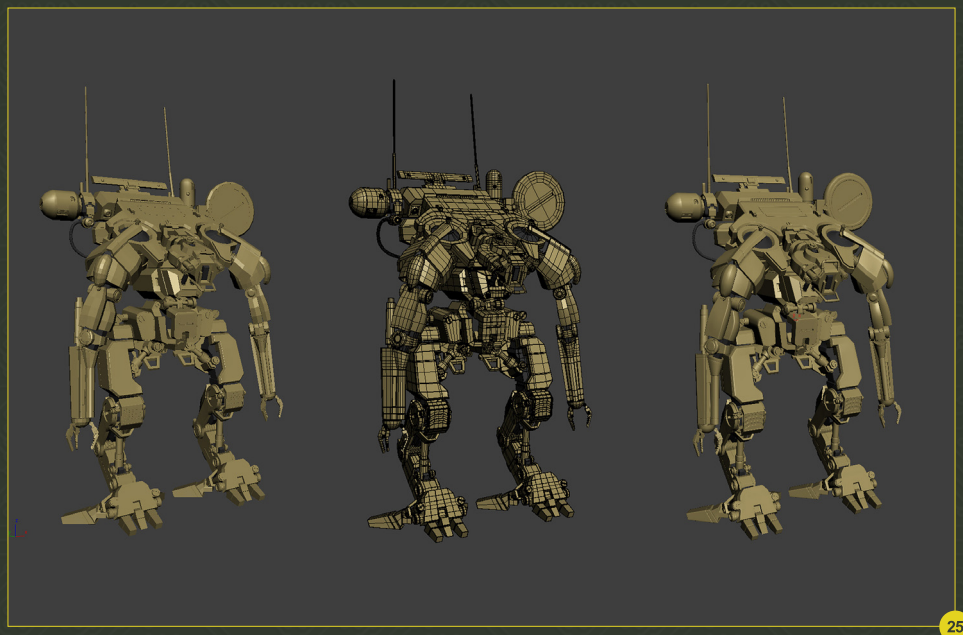
I am now going to apply the same methods as before and extrude the selected edges with a negative height and then chamfer the resulting edges. The cable will have more detail now and will look more appropriate for a droid.

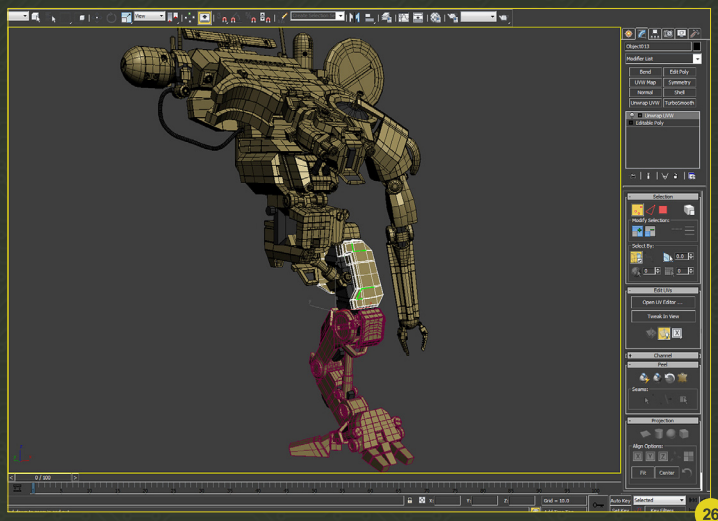
I make some final tweaks to the droid and the modeling is done (**Fig.25**).

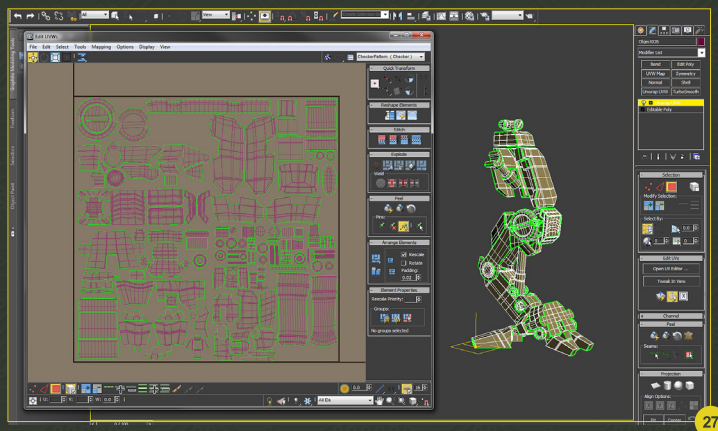
For the unwrapping I'm going to use the same approach, by getting each separate element and unwrapping it on its own sheet (**Fig.26**). You don't want to unwrap the same part twice, so each element that is made twice or can be mirrored is going to be unwrapped once and then copied in the other places that you might need them.

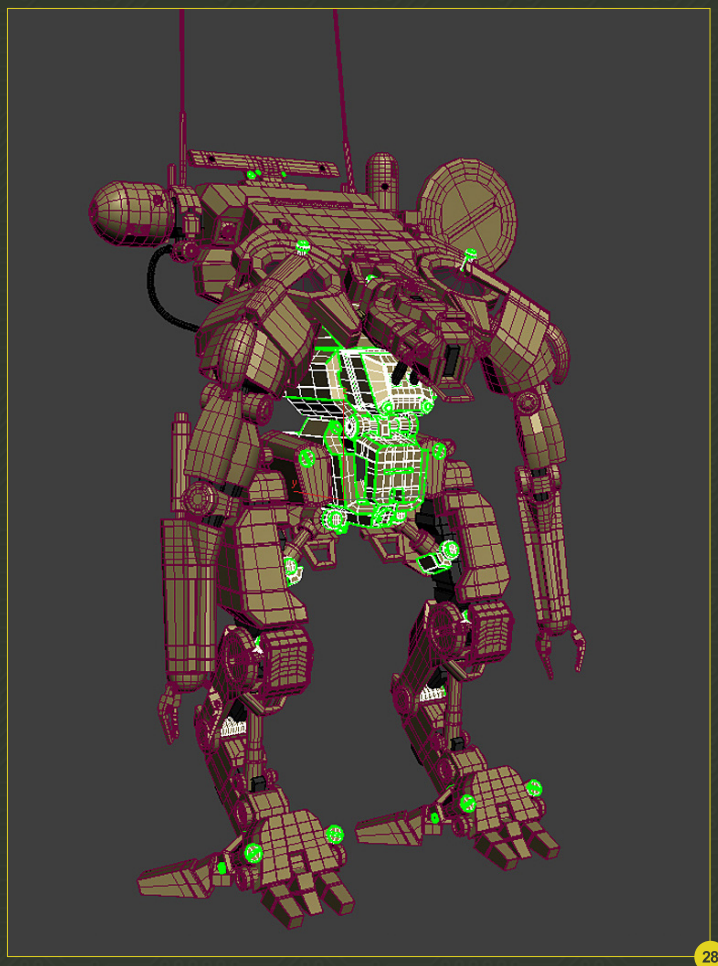


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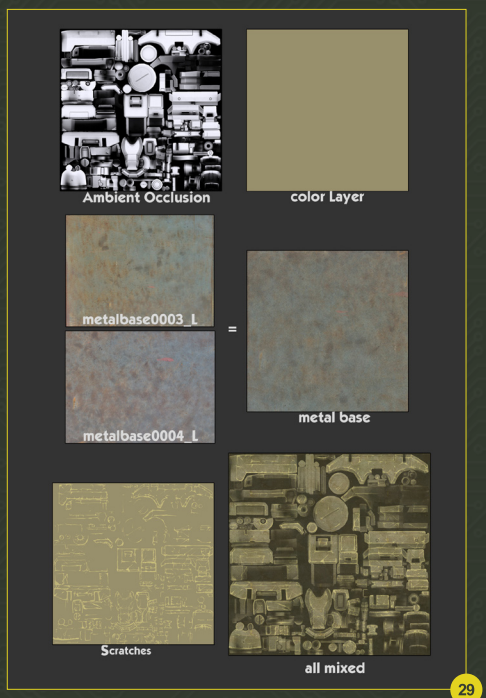

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I am only using the 3ds Max tools for the UVW unwrapping process, as I find them excellent, especially the Pelt and Relax tools. I also tend to use a lot of the Align Vertices function, just to get cleaner sheets.



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Once I've got all the elements of the leg unwrapped, I merge them into a single object and arrange the UW islands on one sheet (**Fig.27**).

As you may have noticed, I'm changing the color of the wireframe of each element I've already unwrapped, to keep track of what I've done.

Once the entire model is unwrapped, I group the bigger parts of the model together on single sheets. You don't want to have too many texture sheets on a robot like this that has over 150 meshes; it's safer to group them together, so once you paint the textures you know what is where (**Fig.28**).

For the textures I start by rendering an ambient occlusion texture. I'm using the 3ds Max standard render for this and the Render to Texture panel. Put just one standard skylight in the scene, activate Light Tracer in the Advanced Lighting panel of the Rendering Setup window, and leave everything on its default setting.

I apply a white material on the entire model, set up the size of the bake to 2048 x 2048 or higher depending on the mesh and hit Render to Texture.

Now I have a large database of textures, including all the 3DTotal Textures, which I use all the time, but I only used two base metal textures from CGTextures.com this time. To get a base metal layer on top of the general color layer, use a Soft Light blend mode in Photoshop (**Fig.29**).

I'm painting a scratch layer by using a small brush and setting up the Shape Dynamics of the brush on Pen Pressure sensitive. It's always good to have a Wacom tablet for this, otherwise it could be a nightmare, and you'd be better off using image textures for this. Textures from the 3DTotal Textures V07:R2 – Sci-Fi DVD are a perfect place to get good metal scratches, even if you use them just as references.

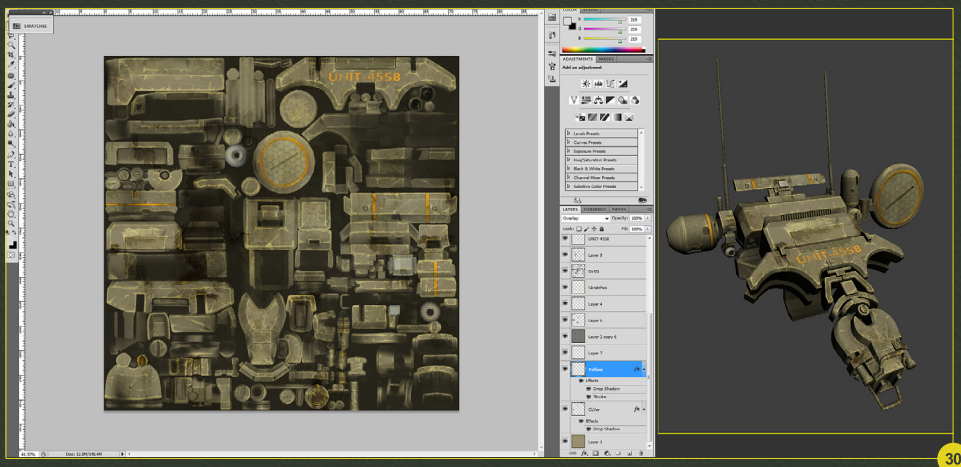
Once this layer is done I put it on top of the existing ones in Normal blend mode. I might decrease the opacity of the layer in some cases. I add some color variation layers and, of course, the dirt layer, which I also paint in Photoshop for this model. There are tons of free dirt brushes on the internet and it's always good to have a large collection of those.

I apply the texture to the mesh in 3ds Max and check how everything works on the model (**Fig.30**). Next I get the Bump map by desaturating the diffuse texture, and inverting and darkening the scratches layer.

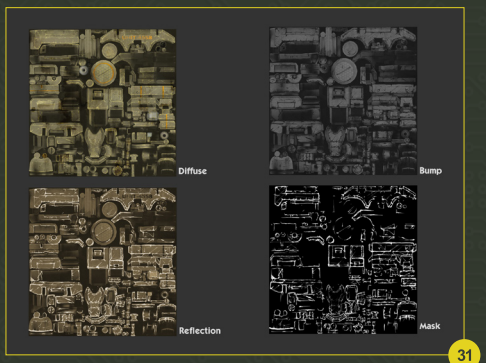
For the reflection layer I'm changing the Hue of the image and making the scratches white this time, as I want to get a shiny metal undercoat. I also export a mask layer for the scratches, as I will want to use a different reflection shader on the undercoat metal (**Fig.31**).

I've ended up using five diffuse textures for this model (**Fig.32**), each 2048 x 2048, plus the Bump, Reflection and Mask texture for each group.

I'm posing the model just by using the mesh parts. As the subject is a robot, I can use its parts as bones and link them into the right hierarchy to get a fast, decent rig for fast posing purposes (**Fig.33**).

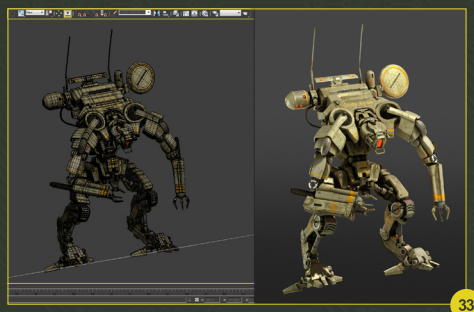


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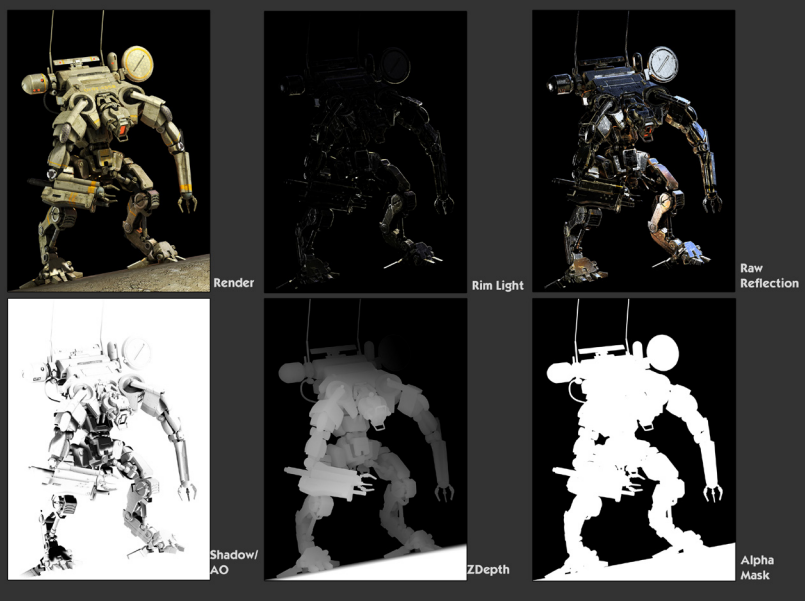


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For the compositing part I use Photoshop and get a number of renders out of V-Ray, thanks to the new Render Elements that V-Ray has. These include rim light render (by using the V-Ray Reflection pass), a Raw Reflection, a Shadow pass (which I got inverted from the original way it rendered, so I could also use it as a Ambient Occlusion pass), a Z-Depth pass and, of course, a Mask layer (**Fig.34**).



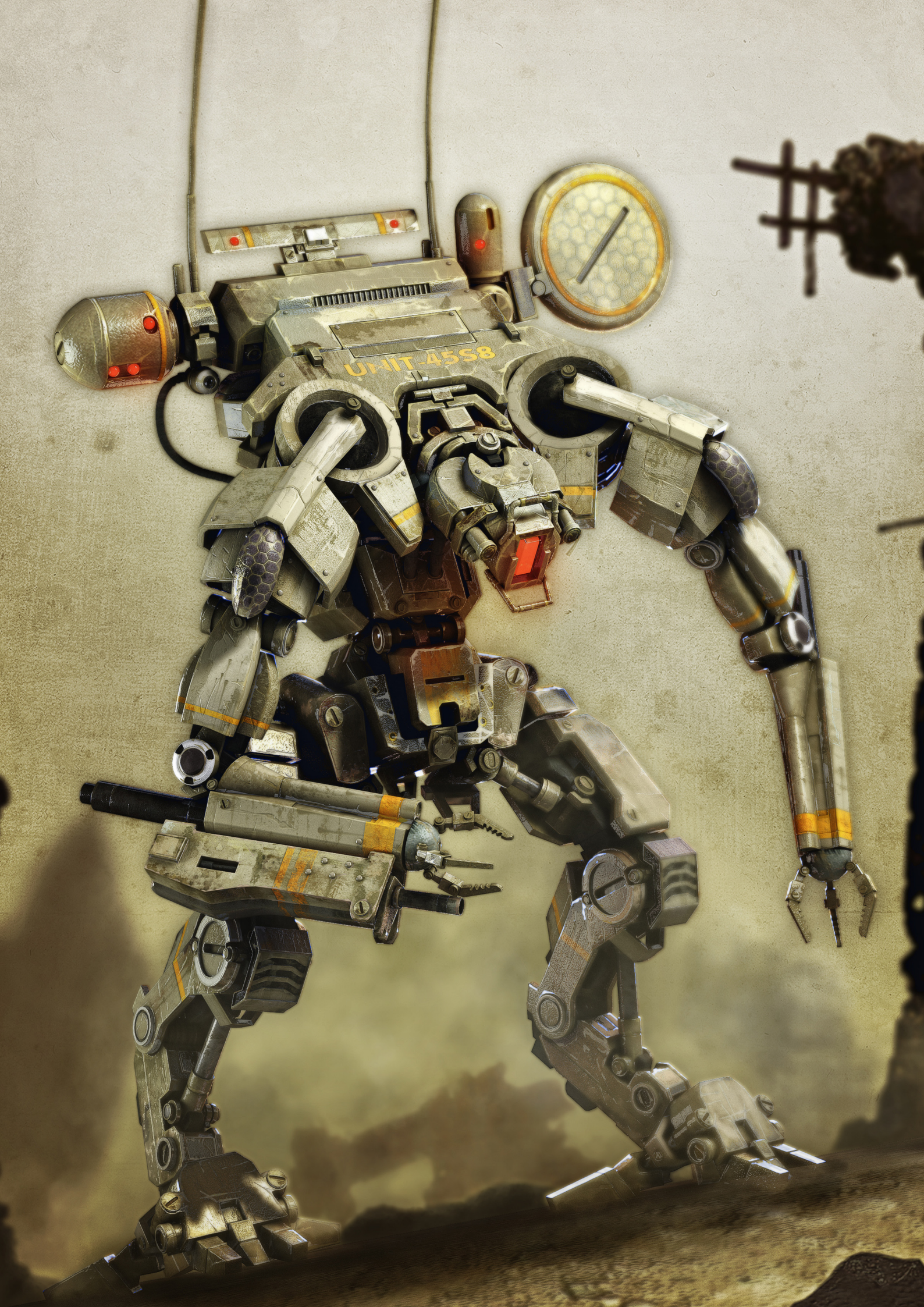
34

The rest of the effects, like dust and glow, I paint in Photoshop. If you want you can use 3ds Max to create particles for this or use a compositing software; something like Digital Fusion will help you do a great job.

I hope you enjoyed following this tutorial and found some useful information to use in the future. The more methods you know and are able to use, the easier and faster your work will become, allowing you to focus more on the creative side of things and not get stuck or delayed by the technical aspects.

I wish you all the best and happy modeling!

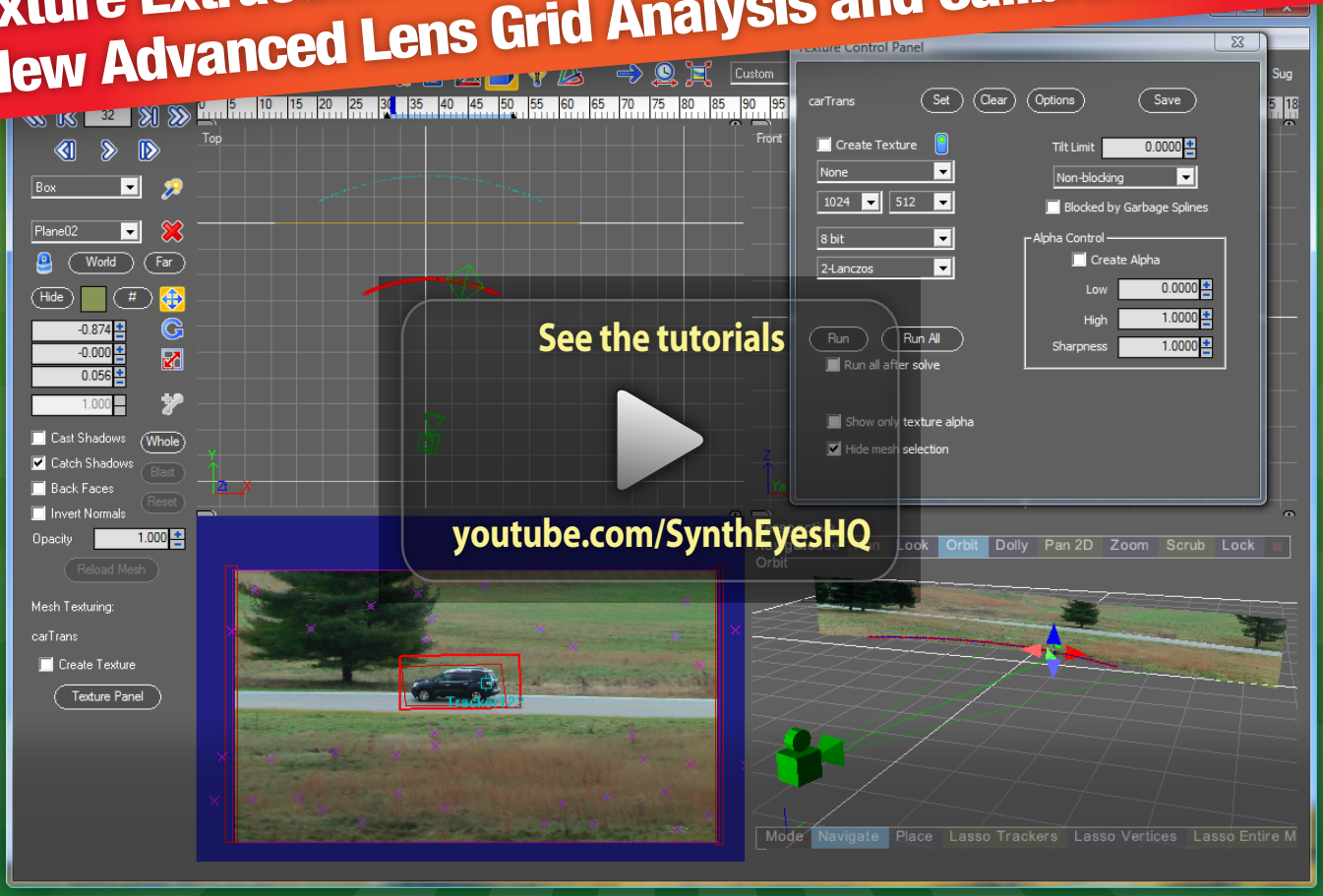
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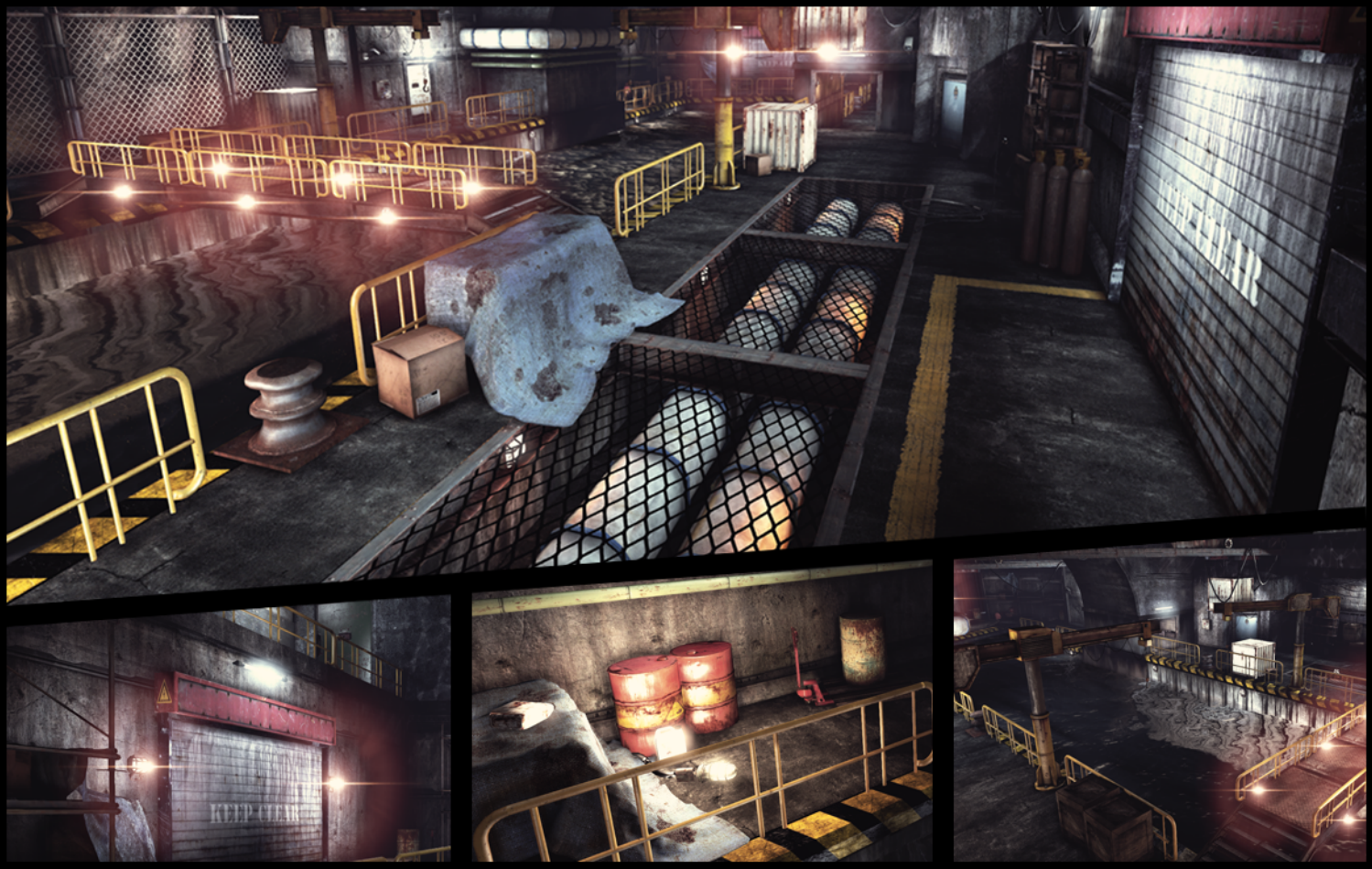


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In the modern world so many things seem to become popular and then disappear just as quickly as they arrived, however the games industry has proven itself to be ever present and continues to develop and thrive. For any CG artist the games industry continues to be the most obvious and abundant form of employment, but taking the step from a modeler to creating a games level at a professional standard is no easy task. In this series of tutorials industry professional Andrew Finch will be talking you through how to make a very cool playable games level using the Unreal Development Kit. Whether you are looking to create a cool portfolio piece or just looking for a fun project to try, this tutorial series is perfect for you.



THE SUBMARINE PEN

JULY ISSUE 083 Concept to White Box AUGUST ISSUE 084 White Box to Custom Meshes THIS ISSUE Finalizing the Environment
NEXT ISSUE Building Objects and Placement 1 NOVEMBER ISSUE 087 Building Objects and Placement 2
DECEMBER ISSUE 088 Details, Decals and Lighting JANUARY ISSUE 089 Finalizing Lighting
FEBRUARY ISSUE 090 Final Polish, Particle FX and Post-Processes

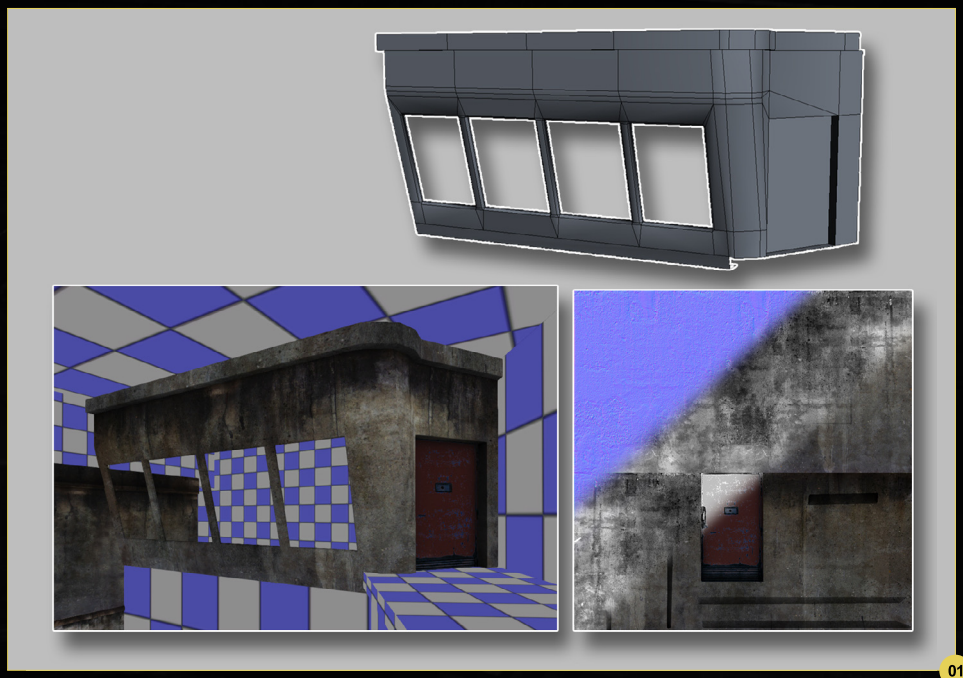
CHAPTER 03 – FINALIZING THE ENVIRONMENT

Software used: UDK, 3ds Max and Photoshop

Welcome to the third part of my tutorial series, in which I'm guiding you through the creation of an environment built in the games engine UDK, from concept through to completion. This is an intermediate-level tutorial and you should have at least basic knowledge of the software used. This tutorial is about the bigger picture of creating an environment; I won't be focusing on creating an amazing asset, instead I will be giving an overview of the process of creating the whole environment.

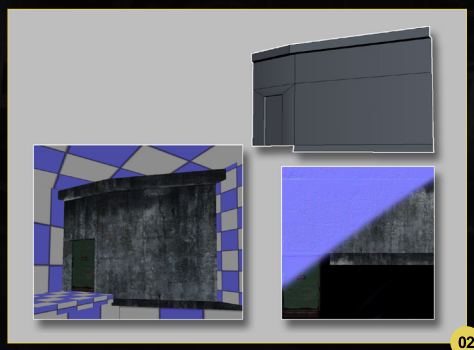
In the last chapter we used the exported BSP geometry in 3ds Max to create extra building assets, and we placed them in Unreal with textures and materials applied. In this chapter we will continue to use the exported BSP geometry in 3ds Max to aid us in building more architectural assets, and start to flesh out the environmental space before we populate the scene with objects and effects.

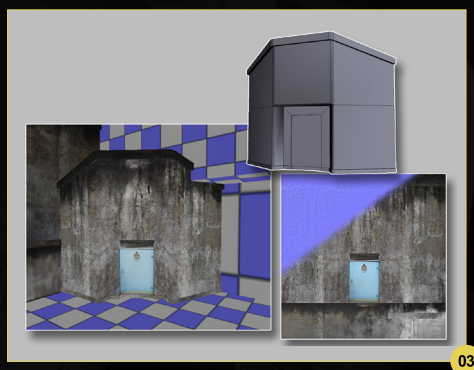
We will also apply temporary materials to the BSP surfaces in Unreal because it will give us a better idea of what the finished scene will look like, and it'll be easier to look at than the default texture. So let's start the third chapter.


01

It's time to start replacing the blocked out areas with more detailed geometry. The models I've created are simple, but for this project will suit my needs. You should spend a lot more time on your assets and get as much detail in them as possible.

Fig.01 – 03 show the completed assets with textures applied and placed in the Unreal engine. Use the same import process described in the previous chapter to get your models and textures into the Unreal engine. I will go through the process again later in this series, when we are bringing in our set dressing assets.


02


03

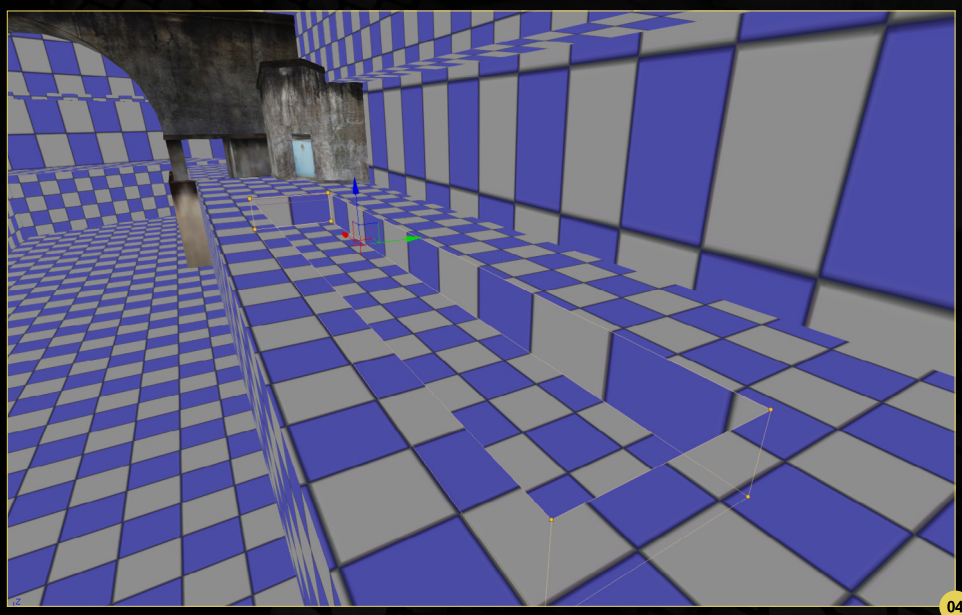
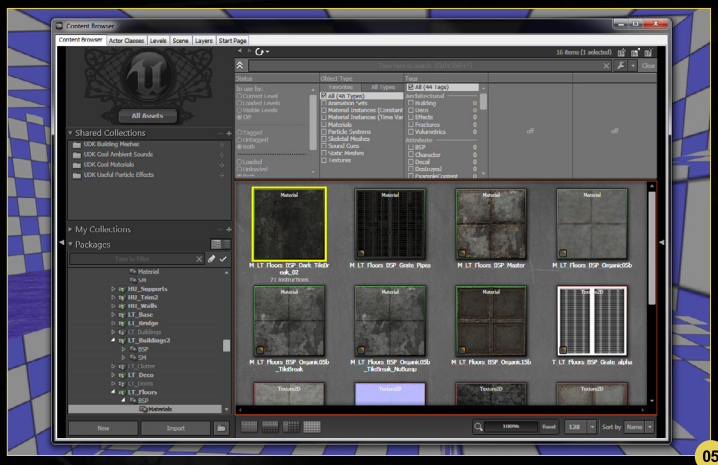
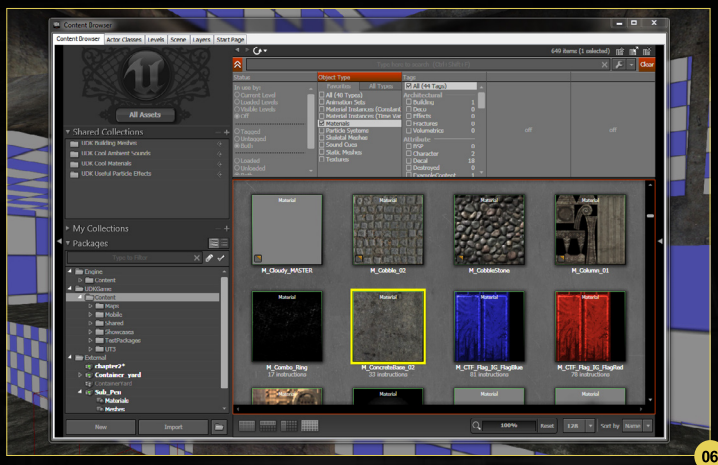

04

Fig.04 illustrates the right-hand side walkway of the submarine pen. The surface area is quite large and this will create problems for us such as tiling textures, overall making it a dull area that takes up a lot of screen space.

To help overcome these issues we can break it up by adding a feature into the geometry. I had the idea of adding pipes that run underground and making them visible with a grate covering them. This also gives us the chance to add


05


06

upward lighting from underneath the grate that casts some interesting shadows on the surrounding areas. Something as simple as this can give us so much in return; it adds multiple layers to our scene, making it more believable as a working environment.

I've subtracted a volume from the BSP geometry that I think is roughly big enough for what we need. It doesn't have to be perfect at this stage. We will dress the area with new assets later on in the project, but for now this is all we need.

At this stage of a project I like to add some temporary textures to the environment; again, this is to aid us in visualizing the end product and hopefully inspire us to create some nice little areas within the environment. I usually search for existing materials and just apply them to the BSP geometry.

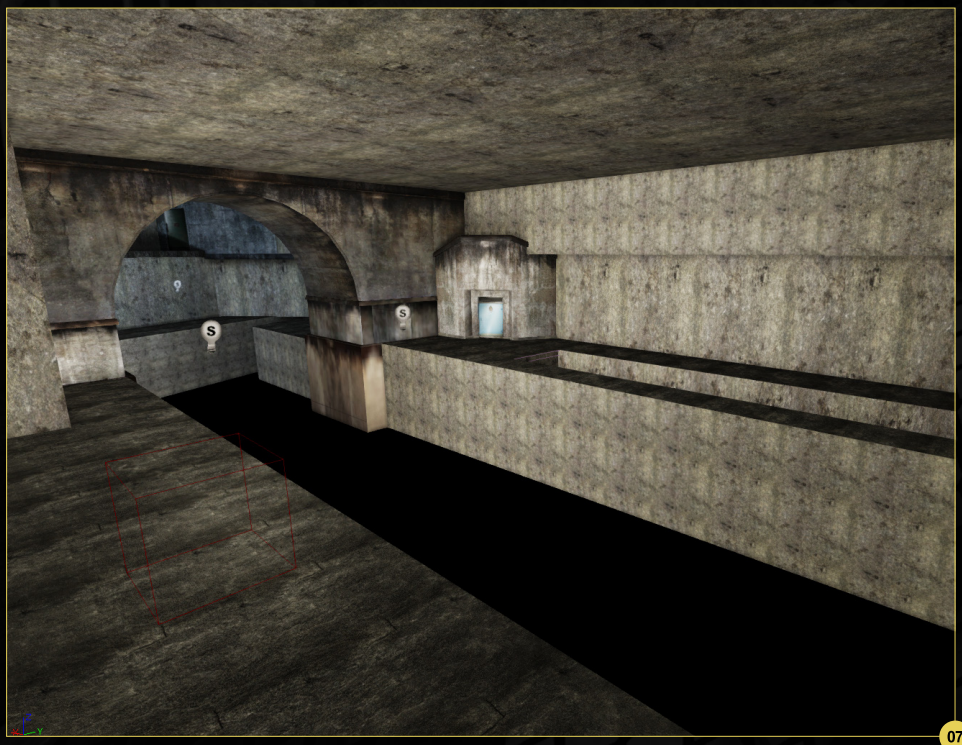
Fig.05 shows the temporary wall material I'm using. In the Content Browser > Packages section, highlight content in the UDK Game folder. In the Object Type section, make sure Materials is selected, as this filters all the content and only displays the materials.

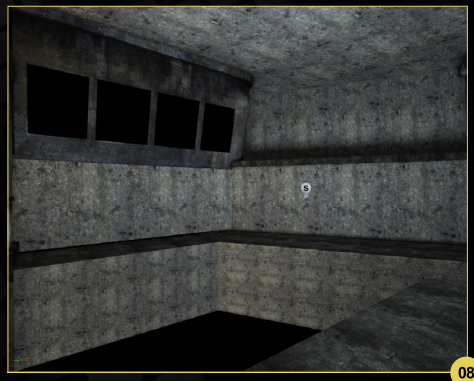
Then browse through the available materials until you find a suitable wall material. I'm using 'M_LT_Floors_BSP_Dark_TileBreak_02' on the floors, which is highlighted in the image.

Highlighted in **Fig.06** is the material I've applied to the walls, which is 'M_ConcreteBase_02'. To quickly apply the material to the walls and floors, select the material in the Asset Browser. Then hold down Alt and navigate through the viewport, clicking on each wall or floor surface to apply the material automatically. This is a quick way to flood-fill the entire scene with a material. We don't have to worry about UV mapping at this stage as long as the textures are applied to break up the surface areas.

In **Fig.07** you can see the temporary floor and wall textures applied to the BSP geometry in the scene. You can also see the custom assets in place and are almost ready for set dressing. I still have the draft lighting in place; this is good enough for us now as we start to move on to the next stage.

Fig.08 – 09 show the second room and a viewpoint looking back through the archway at the main hall. Again, I've applied some temporary materials and used omni lights to illuminate the scene.


07


08

The environment looks a little open at this stage and I think it is giving us a false representation of the space available. I think this is because the water is not in the scene. Once the water is placed, it will give us a totally different feel to the space around us.

So, for now let's add a simple Plane BSP geometry to represent the water's surface. We don't need to worry about adding a nice water material just yet, as that will be part of our polishing stage.

Add a simple BSP plane that stretches the entire map and sits just below the walkway edge. Shown here in **Fig.10 – 11** are the main room and second room. As you can see, now the whole environment feels a lot more claustrophobic and gives us a better idea of the available space around us.

A large feature of this environment is the bridge that connects the two sides of the map. As this will play such a big part in the composition of the environment, I want to add in a temporary bridge. Again, this is just to give us a rough idea of the scale of the bridge and if it will fit okay within the environment.

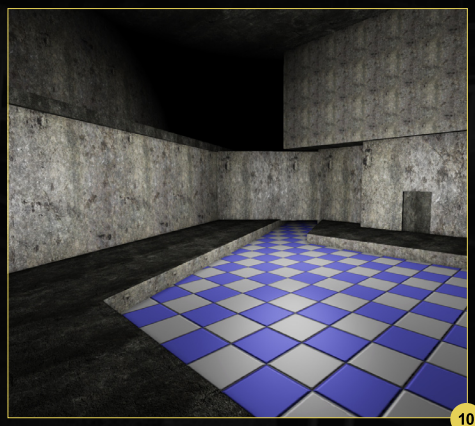
Next, create a simple plane and in Edit Geometry mode, split it three times horizontally. This gives us six extra vertices in the middle of the plane. Select these six vertices and move them up to create a ramp on either end of the bridge.


09

As you can see in **Fig.12**, I've also added two small, red, temporary lights, just to add a bit of interest and make the bridge stand out from the rest of the environment. This won't be the final position of the bridge, but it's good enough for us to get an idea of what it will look like.

Well that wraps up this part of the project; we have our final draft of the environment with all the necessary navigational meshes and three main architectural assets in place. We also have temporary textures applied to all the surfaces and draft lighting.

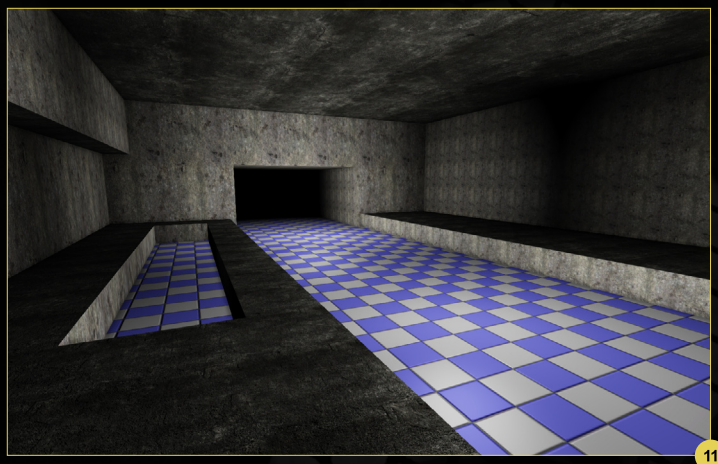
The next phase of this project is filling the environment with polished assets, such as barrels and shelves etc., and starting to add finalized textures. Our environment will very

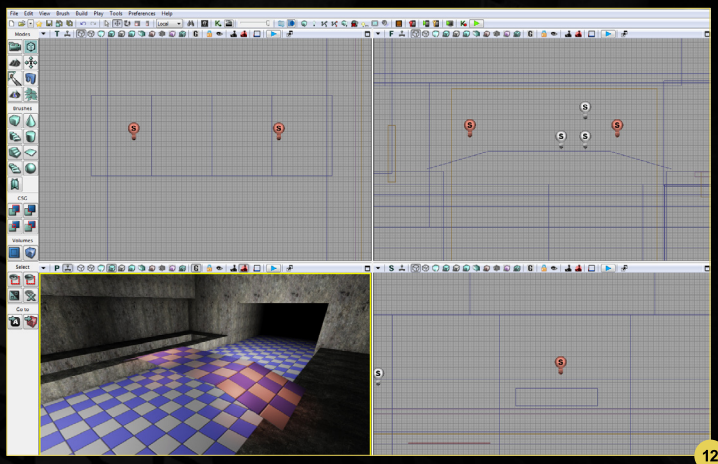

10

quickly start to look finished and professional now we have the solid foundations to work from.

Thanks for reading.

ANDREW FINCH
Email: afinchy@gmail.com


11


12

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CHARACTER PRODUCTION



Over the last couple of years, modeling realistic 3D heads and busts has become really popular. In this series we will be shown how to do this using 3ds Max, Maya and ZBrush. From the basic head model and a highly detailed head sculpt, through to texturing and post-production, our artists will cover every aspect of the creation process, providing us with the perfect opportunity to learn from their experience.

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JULY ISSUE 083 Texturing and Shaders
AUGUST ISSUE 084 Hair and Clothing
THIS ISSUE Rendering and Lighting

CHAPTER 06 – RENDERING AND LIGHTING

Software used: 3ds Max

We are now down to the last chapter. All the different pieces have been modeled and textured, my shaders are done and the scene is almost ready to be lit and rendered.

As you can see, I modeled everything in a front view. I didn't pose my character in ZBrush, and everything is still frontal and boring. I knew I wanted a simple pose, with only a tilt of the head and I knew I wanted to pose it at the end in 3ds Max, by using a very simple bones set up.

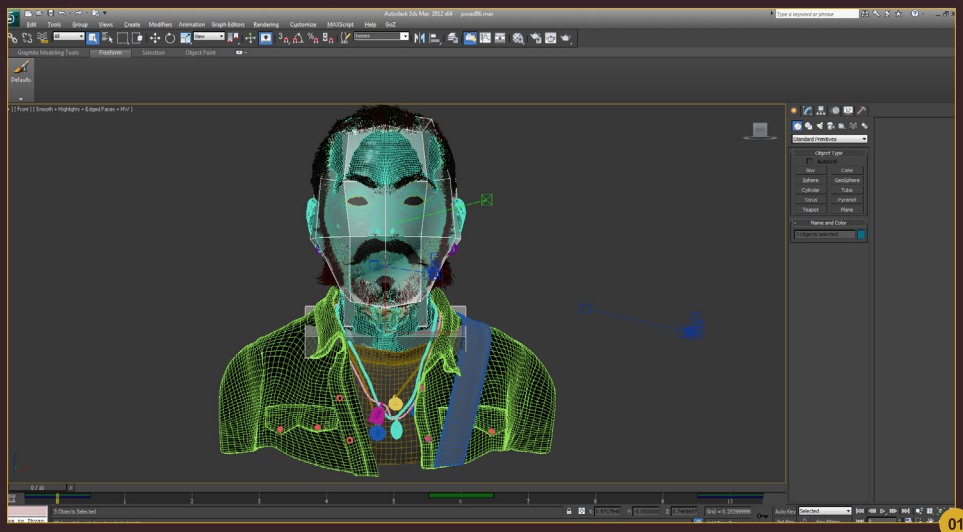
I only wanted to focus on three things for this picture: the eyes, the mouth and the overall bright lighting; I didn't want to surcharge the picture with too many elements. I knew that the pose would be very subtle and involve only the neck and the head. It's something I like to do with a simple scene; I create very simple geometry, which I link together and use as bones. This gives me the opportunity to quickly test different orientations without having to go back to ZBrush for every change, and it allows me to move all the pieces as one very quickly.

I created a box for the torso, another box for the neck and another geo of the size of the head (**Fig.01**). It wasn't accurate to the anatomy, but it was good enough to get the tilt to the head.

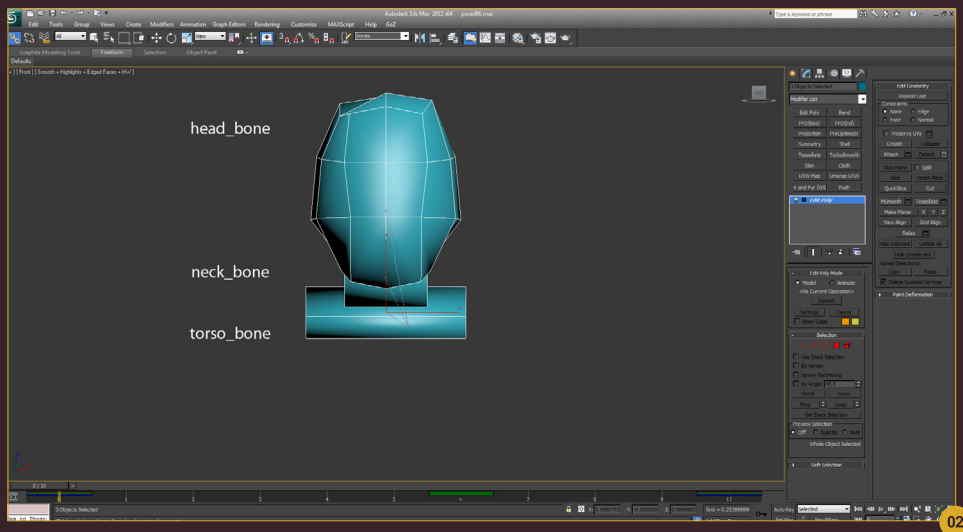
Once the three bones were in place, I linked the head bone to the neck, and then the neck to the torso. Now the parent was the head and if I rotated the neck or head bone the torso wouldn't be affected (**Fig.02**).



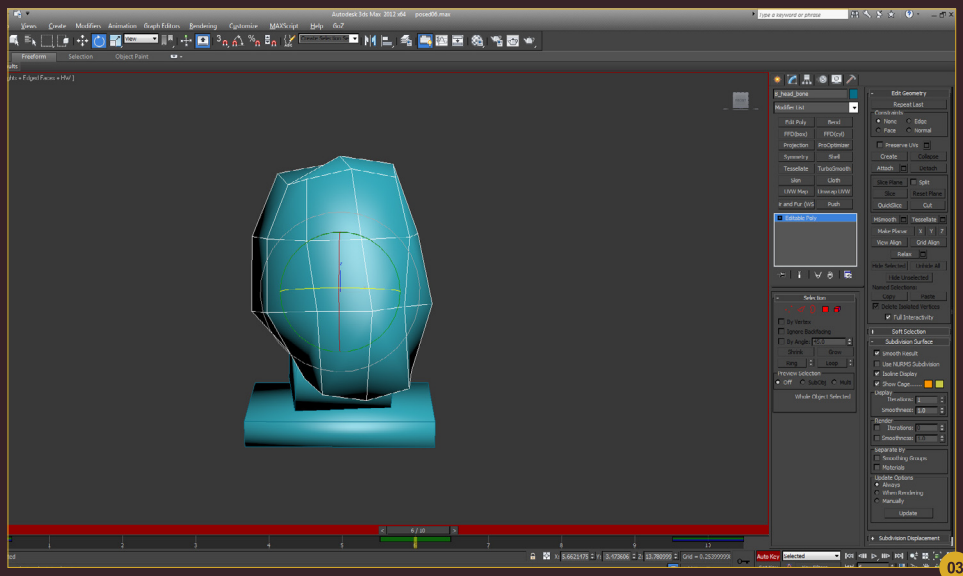
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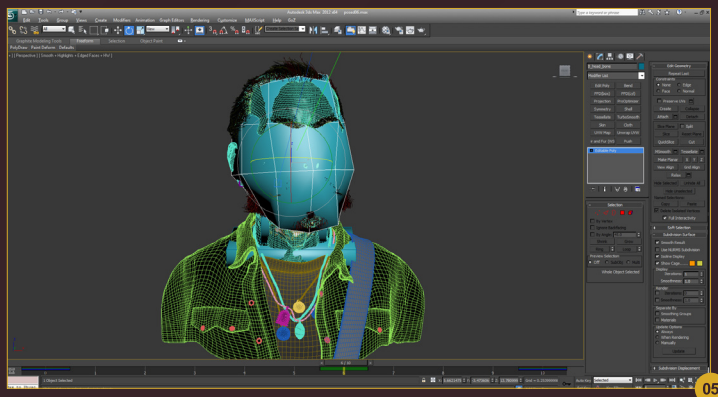
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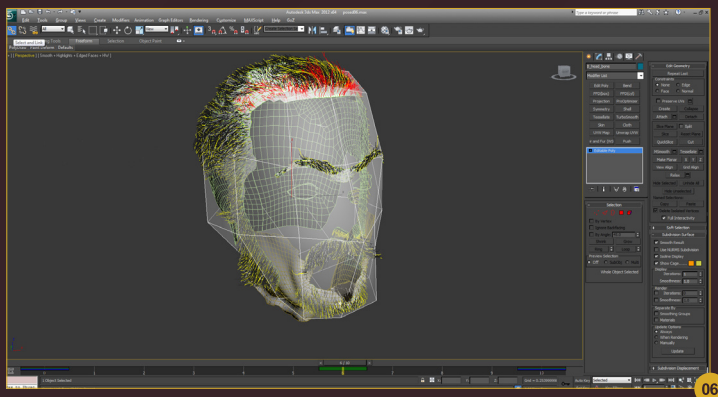


03

The next step was to rotate the head bone and neck bone to get the pose wanted. I did one or two different poses on different key frames, with the Auto Key activated to go between the two and see which one I preferred (**Fig.03**).

Once the bones were posed, I selected my head model, applied a skin modifier and added the three bones to the list. I didn't even need to do any skinning tweaks, as the head was deforming well enough to use the skin as is (**Fig.04**).

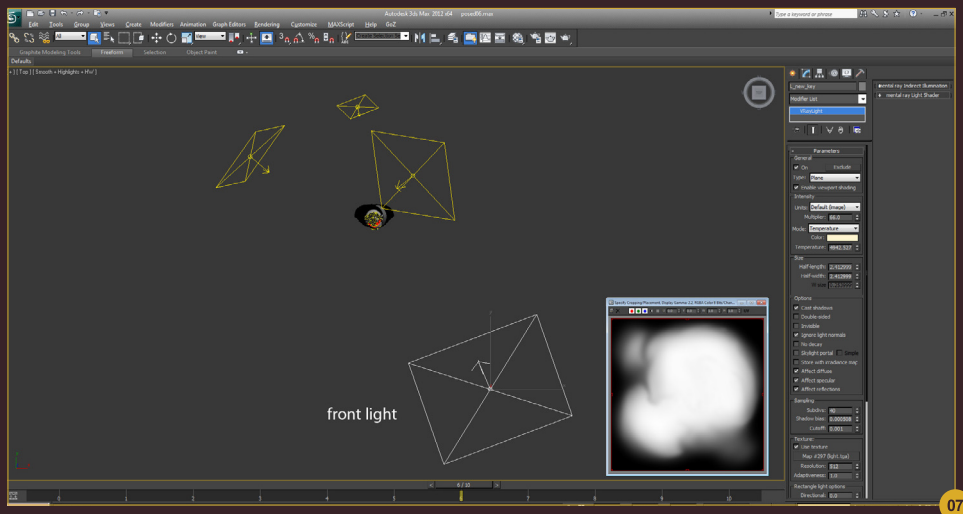

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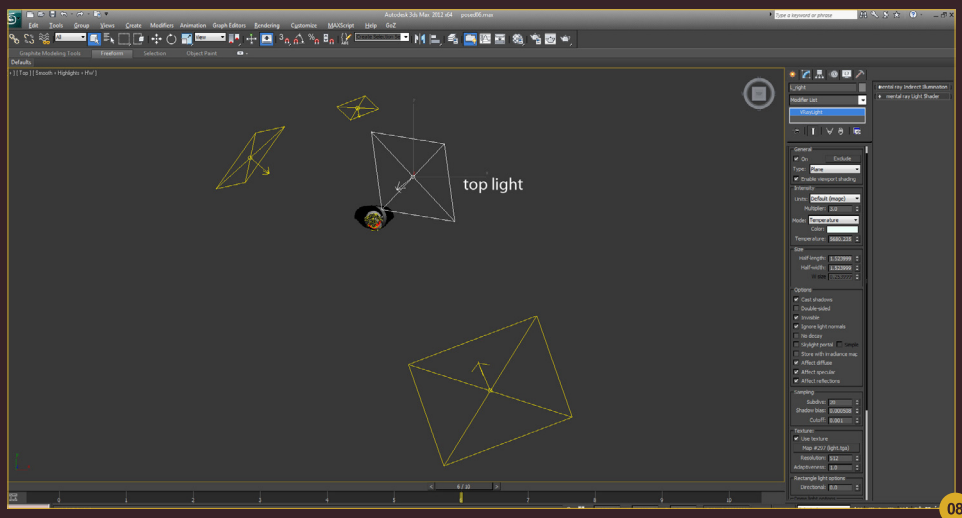
Only the head model needed a skin modifier, since I didn't want to move the rest of the body (**Fig.05**).

The hair parts, and eyes were done very quickly, I linked all of them to the head bone (**Fig.06**).

Now all the elements were in place and ready for the lighting part. Most of the time I start this part with two or three lights, but for this one I ended up using four to boost the SSS effect and the Fresnel on the clothing. I used one main light to light the scene from the front of my key light



07

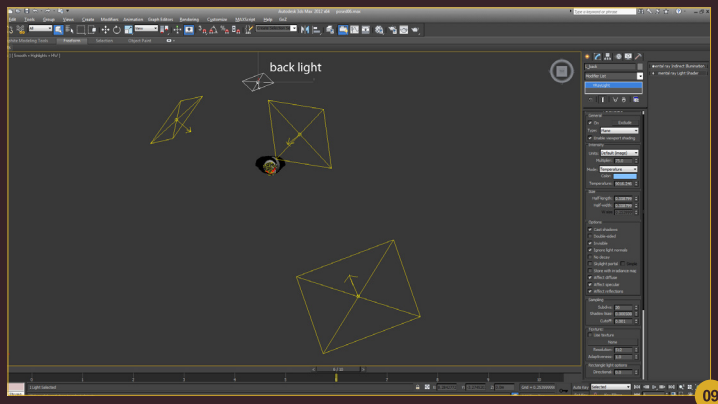


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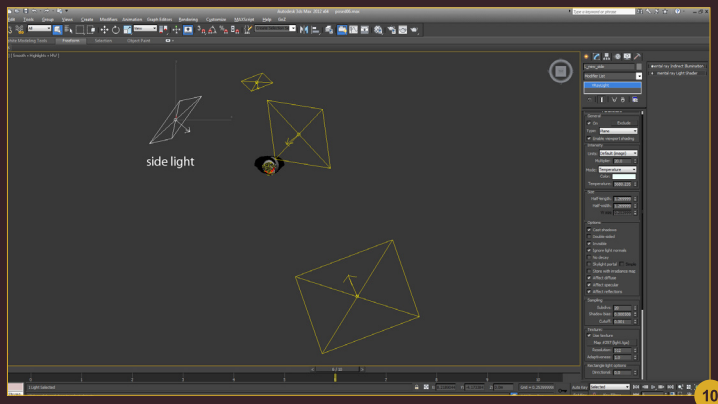
and I plugged a small texture one in Photoshop, so as to not have a perfect circle of light hitting my model. I kind of see this as adding clouds in front of my light (**Fig.07**).

I wanted a smaller, but more intense light to hit the top of the forehead and I also used the same texture for this light (**Fig.08**). For the back and side light I didn't use any texture (**Fig.09 – 10**).

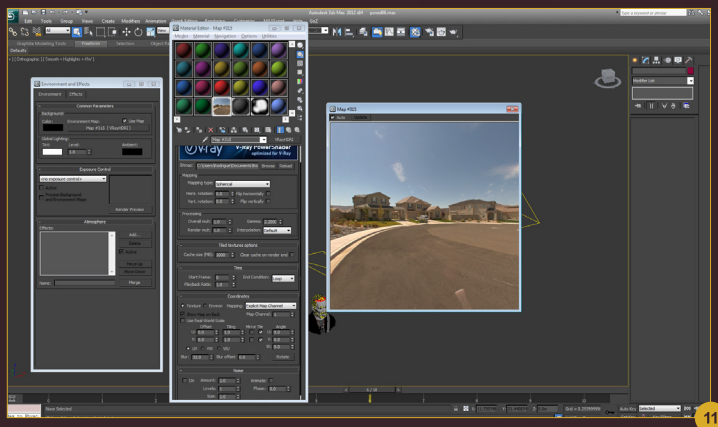
Also very important for the lighting of the scene is the HDR map that I used for my Ambient and



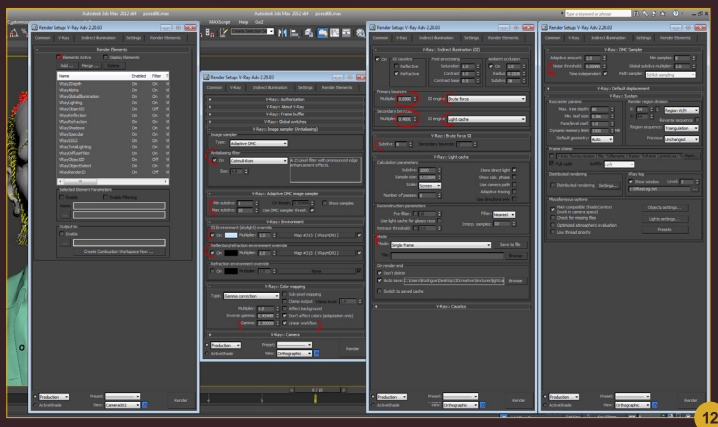
09



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12

Reflection maps; I used a free HDRi that you can find online at: **http://www.hdrmill.com/Freebies.htm**. In the Environment and Effects panel I plugged in a VRayHDRI, that I clicked and dragged as an instance in my Material Editor and I used the HDRi with a Spherical Mapping type (**Fig.11**).

In my Render Setup I made sure that the HDRi was used in the GI Environment override and the Reflection/Refraction override. It's important to note that I'm no lighting or render specialist and you might see mistakes or redundancy in my settings. A lot of what I do is just playing with the settings and doing a lot of trial and error. The settings and values I've used here are based on what I think look good to me, but in no way is it what you have to do/should be done (**Fig.12**).



13

Normally I do different renders for each light, plus tones of different passes with different shaders and settings, but nowadays I like to try to get a render that already looks good to me straight from 3ds Max/V-Ray.

I did many tests, playing with the intensity, color and size of the lights, and at one point I found a balance that I liked (**Fig.13**).



14

To get quick tests, don't forget to use smaller size and small subdivisions in your image sampler, with a bigger Noise Threshold during your tests, otherwise you will quickly get frustrated by the slow speed of your tests. You need to keep them small and fast to stay motivated and allow you to do many tweaks and changes until you get what you are looking for.

I also activated Render Elements. I didn't used them that much except for the Depth pass (used later with the Lens Blur filter in CS5) and the ID pass to quickly have access to my object selection (**Fig.14**).

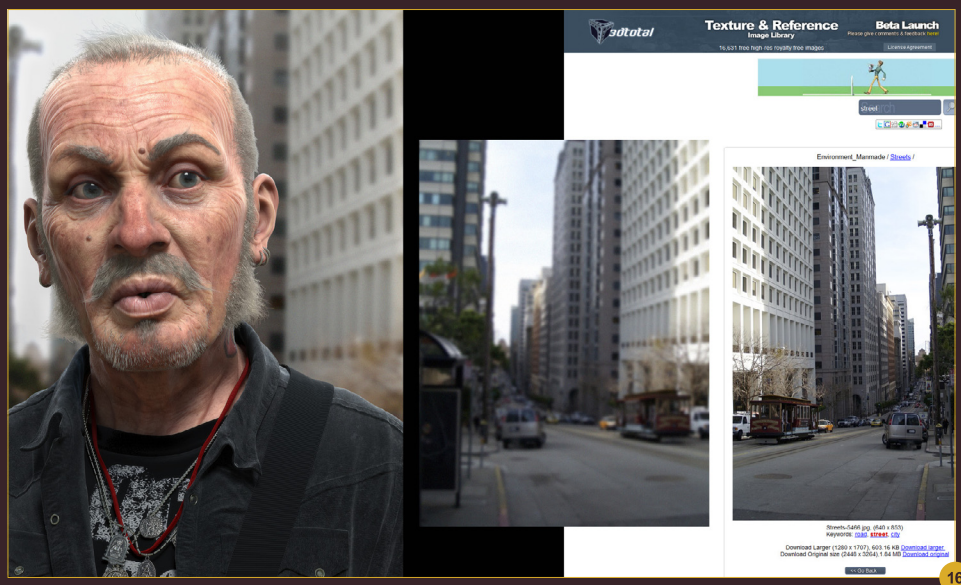
Tweaking the lights was the biggest part, but once it was done I was able to get a render that was almost what I wanted straight out of 3ds Max.

The next step was to render the picture to its final size and to start retouching it in Photoshop for the final presentation. The first thing was to add a bit of dirt to the shirt; it was looking a bit too clean, so I added a small texture in Overlay mode to bring more break ups. I also reduced the reds that were a bit too present for my taste and boosted the contrasts a bit by playing with the levels (**Fig.15**).



15

At one point I realized that even though I didn't want the background to be too present, the one that I had was way too boring and flat to be interesting. I looked at the street pictures available on **www.3dtotal.com** and found one with vertical lines and lots of geometric and hard shapes, which would beautifully balance the round, organic shapes present on my character. By changing the background picture my reflection and overall color on the character wouldn't fit with the environment anymore, but I decided that a bit more work in Photoshop would be worth it to make the picture look more interesting. I flipped the picture, blurred it and added a bit of noise and Lens Blur to it to get something that would work nicely in the background of the scene (**Fig.16**).



16

The next step was just some old-school trial and error in Photoshop. I used the airbrush to blend the bright areas of the background picture with the hair of the character more, and soften the hard edges present in the background, which also gave more depth to the picture.

With the standard simple brush, I added more hairs and blended them with the rest of the head. Finally I drew some circular shapes and a few lines coming out of the mouth for the smoke, and I used the Smudge tool and the Blur tool to have a better looking smoke effect (**Fig.17**).



17

Overall this project was very fun and very fast to do, and I was very happy about the final colors and overall mood of the picture. As always, once done I started to see many elements that I would now do differently, but it was interesting to try a different approach to my renders and to play with the Hair plugin for 3ds Max for the first time.

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CHARACTER PRODUCTION



Over the last couple of years, modeling realistic 3D heads and busts has become really popular. In this series we will be shown how to do this using 3ds Max, Maya and ZBrush. From the basic head model and a highly detailed head sculpt, through to texturing and post-production, our artists will cover every aspect of the creation process, providing us with the perfect opportunity to learn from their experience.

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THIS ISSUE Rendering and Lighting

CHAPTER 06 – RENDERING AND LIGHTING

Software used: Maya, ZBrush

In this sixth and final chapter of the series, we will put together everything we've done so far in a nice and realistic render. Unfortunately we didn't have room to cover every single step in the process, but the things I chose to leave out are more or less self-explanatory, like the texturing of the clothes and modeling eyelashes. Once you explore the downloadable content from this tutorial any missing parts will fit in to place. So without further a do, let's move on to the assembling of the final scene.

Instead of recreating the image you can see at the beginning of every tutorial, this time I will use the actual scene to describe the rendering and lighting process.

The good thing is that the content that you can download with this tutorial will give you an identical result to my final image. You can use it to follow this tutorial or as a scene preset for your own character. You will find some slight differences in the scene assets, but that will not affect the course of this tutorial.

Over years of work, I've found that the strategy that works best for me is to start with lighting a gray-shaded model, because it's much easier to read shape without all different colors and materials. Once I am satisfied with the result, I will make it more interesting with different materials and textures.

Load all the assets you made so far for this scene and assign a new V-Ray material to all objects. Leave the material on its default settings and name it something like "test material". This would be a great opportunity for you to use the V-Ray RT render, which will give you almost instant feedback.

For the easiest setup and most realistic result I've decided to use IBL (image based lighting). V-Ray can utilize IBL in a couple of different ways, but the easiest to set up is a dome light, which is an infinite big light that surrounds everything in your scene. The default dome light is white in color, which is a great way for adding ambient light to your renders. Instead of a clean white light we will color the light with a HDR image. The effect of using light in this way will result in very realistic environment lighting.

From the Create menu choose Lights and create a V_Ray_Dome_light. Under the light shape attributes scroll down to Texture menu and upload a HDR image. For this example I'm using the "kitchen_probe" HDR image, which I downloaded for free from **www.pauldebevec.com/Probes/**. You will find there are many other examples of so-called light probes that also work well with this or any other scene, and I strongly encourage you to try a few other HDRis as well.

At the top of the light's attributes you will find a small box named Sample, which will show you the approximation of the light's color intensity and you can use it for setting up the initial intensity for this light.

Once you load such an image into the dome light, Maya will automatically create an image placement node, where you can make some additional settings, such as rotating a light or choosing a type of mapping.

A Rotation setting of 126.00 units and Intensity of 0.800 works fine for me and you can see my first render with this setup in **Fig.01**.

To gain more control of your lighting, you can experiment further with the light probe dynamic range by shifting settings like Alpha Offset and Alpha Gain. In **Fig.01** an Alpha Offset of 0,500 gave me the best result. Image-based lighting does not have to stand all by itself; you can always add some additional lights to better frame your character.

In **Fig.02** you can see another example of the image-based lighting; this time I've used an image probe called "campus probe", which is an image of an outdoor scene with a little bit of low sunlight and a yellowish color tint on the side.


01

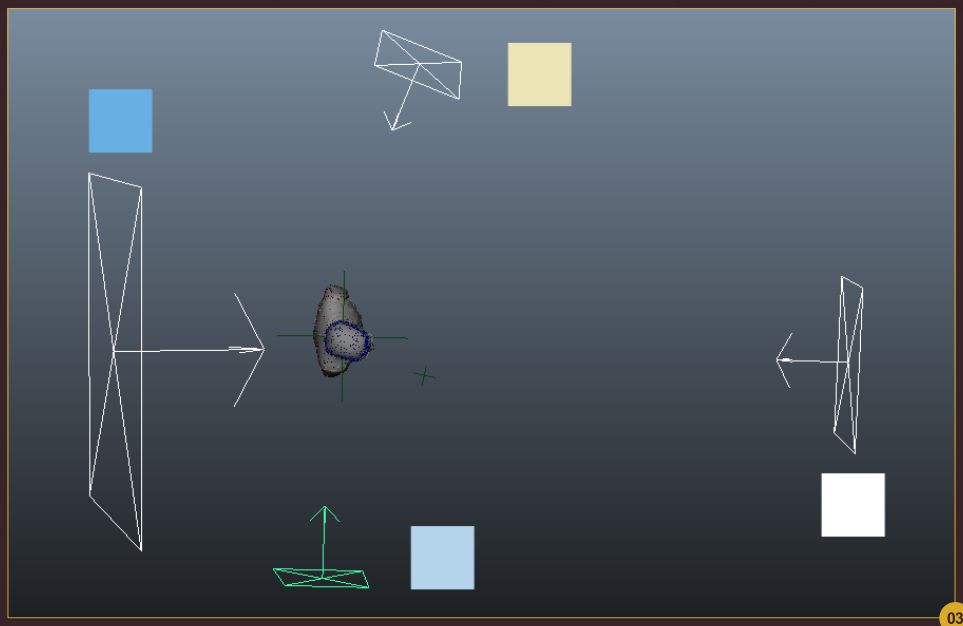

02

As you can see you can get some really interesting results with image-based lighting and change complete scene lighting with one file. Since dome light emits from all sides around your model, it almost looks like the scene has been lit with global illumination techniques, adding a great sense of realism to the render.

Another good way of lighting your scene is with another type of light, such as V-Ray rect. lights.

For the next example I will construct a basic studio lighting setup, arranged with four V-Ray rectangular lights. I will have two key lights (one for each side of the face, placed on the left and right), one fill light in front to lighten up dark areas and a rim light for the back to give the character some outline for better framing.

You can see the placement and colors of the lights illustrated in **Fig.03**.

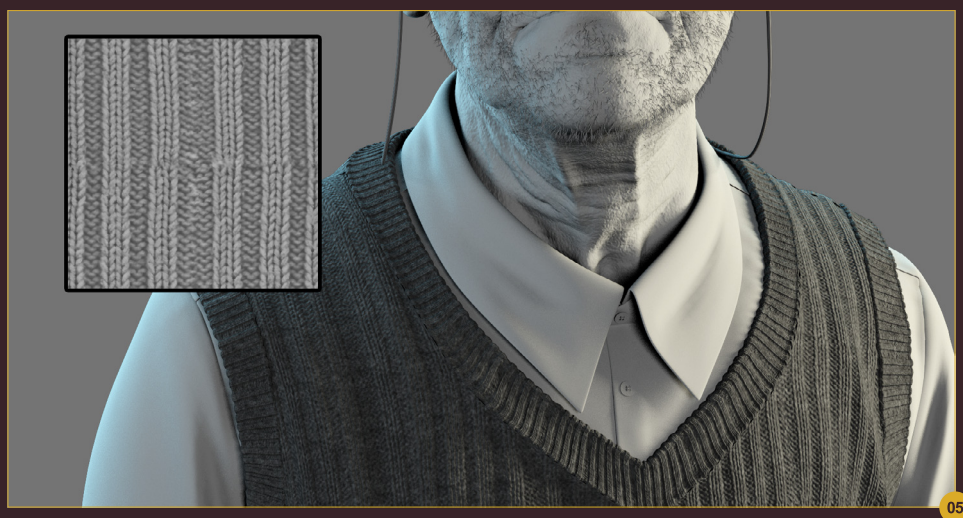

03

Just by tweaking the intensity you can get a few different and interesting results, as shown in **Fig.04**. Another good idea would be to parent all light to a locator placed at the center of the scene. By rotating a locator on a Y axis you will be able to rotate the whole light rig around the model.


04

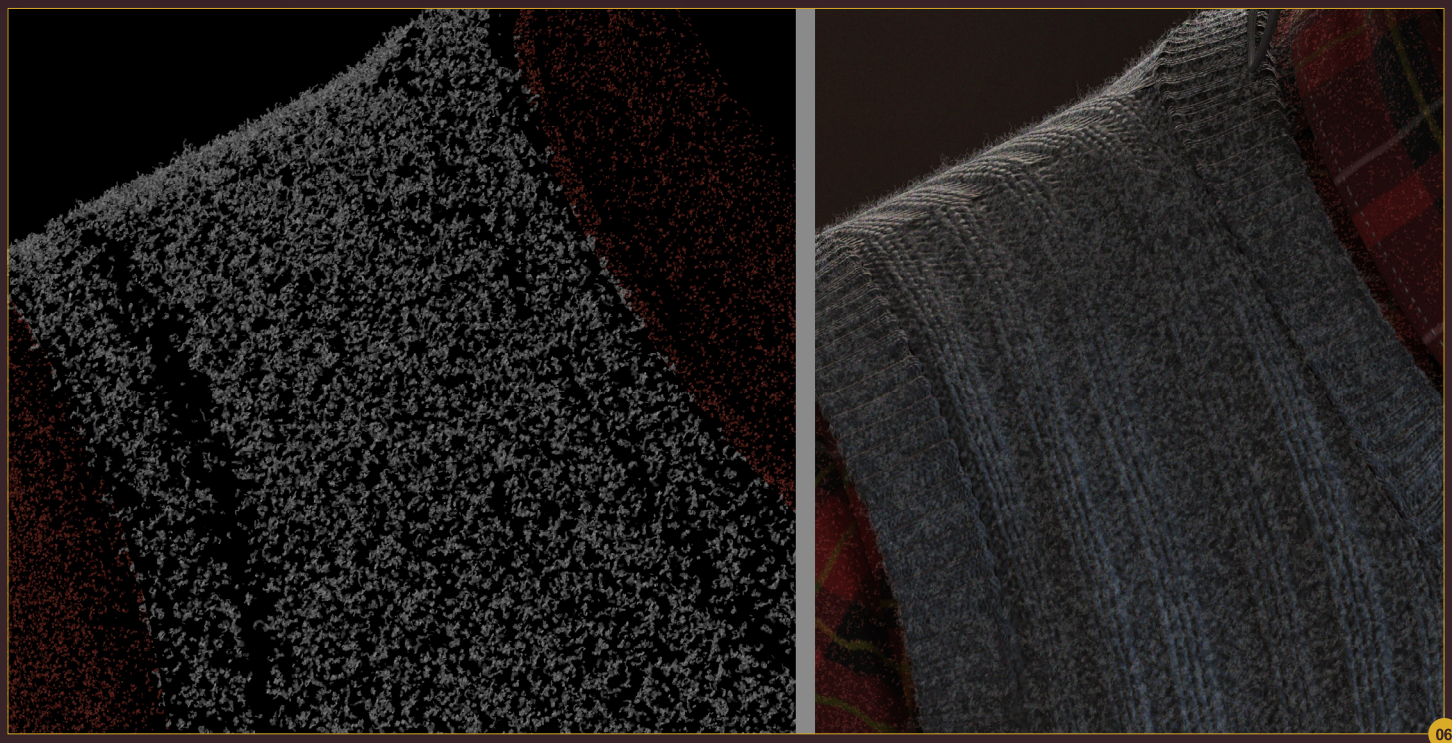
Now, when you have your favorite light setup blocked, it's time to turn our attention to materials. Since we have already covered skin material shading in one of the previous chapters, let's say a couple of words about shading the clothes.

All of the cloth pieces have some sort of repeating pattern and naturally those patterns are placed from seam to seam. To achieve that kind of look with a small repeating pattern, it's essential to model cloth with the topology following those seams.


05

Another important step in the process is to make cuts in the UV shells along the seams. Once you have constructed the clothes following those simple rules, it's quite easy to do the surface details by repeating a weaving pattern across the whole mesh without actual additional texture painting.

You can see how a few simple seamless patterns repeated across the whole vest work in **Fig.05**. The same process can also be applied to the cap.



06

Further cloth realism is achieved with the addition of some surface hairs. To make this process as simple as possible I will work with Maya Fur, which comes with some presets that can be used as a starting point. After making a few changes to the selected preset, I render hairs with the Maya software renderer on a cloth model with a black surface shader. Maya Fur renders extremely fast with the software render, and after less than three minutes I have a fur pass to composite over a beautiful render (**Fig.06**).

You can also experiment with V-Ray fur, which is also great and very easy to set up.

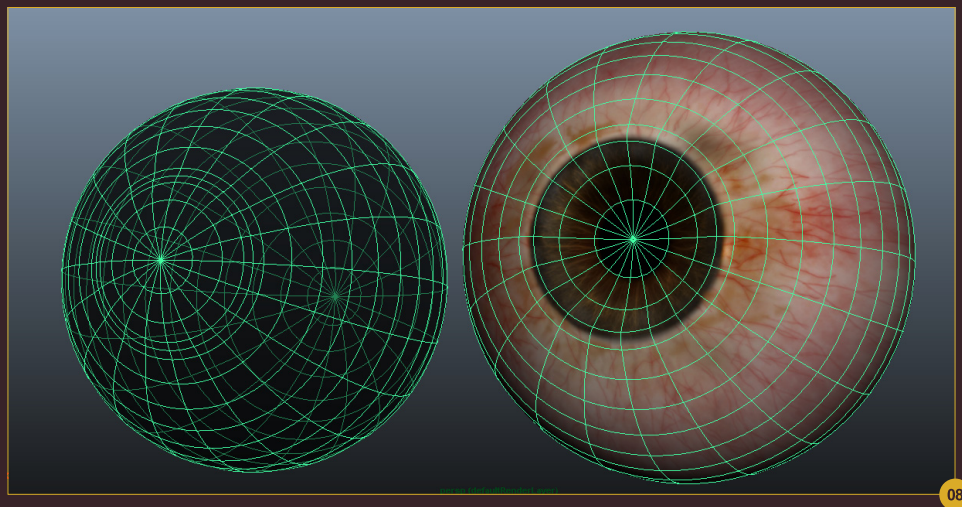
To set up the V-Ray fur, select the object you wish to grow fur from and go to Create > V-Ray and Add VrayFur to your selection. You will instantly get feedback of the created fur in the viewport and can quickly set up a desired look. Note that V-Ray fur will inherit material from its base surface. If you want to have V-Ray fur with different materials you can copy the object, assign it to the other material and turn off the object's visibility in the shape node object display. **Fig.07** illustrates the detailed cap surface with V-Ray fur.

Another important part of achieving a realistic CG model is the creation of the character's



07

eyes. There are a couple of important things worth mentioning when it comes to eye creation. An eye model can be constructed out of many parts if you are going for an anatomically correct model, but the easiest way would be to use two models, one for the outer transparent layer with the cornea and another for the layer with the iris and sclera. These separated models are shown in **Fig.08**.



08

The inner part should be shaded with subsurface scattering and the outer part with a fully transparent material with the index of the refraction set to 1.3 or more.

After assembling everything together, the last thing to do is to set up a render resolution and sampling.



09

Note that more image resolution requires less precise image sampling. V-Ray offers us three types of image sampling: Fixed, Adaptive Subdivision and Adaptive DMC. Image sampling could be a whole tutorial in itself, so let's skip the complicated stuff and cut to the basics.

I often use the Adaptive DMC method because it works best with the small details, like hairs or skin pores, which are important for achieving a realistic image. If you are using low samples you will have probably lost many fine details you sculpted in your model's face, so you have to use fixed or low adaptive subdivision; only for testing or if you are rendering a big resolution.

If you are going for a 1080 px video render or similar resolutions I would definitely recommend DMC with minimum 1 and maximum 6 samples.

You can see a couple of frames captured from the turntable video in **Fig.09 – 10**.

Threshold parameter also plays a big role in image sampling and you will get more precision and less noise with a lower threshold.

If you are rendering big resolution stills, like 3000 px or above, you can probably get away with default V-Ray settings, but I would definitely recommend using a DMC for those who are looking for more details and have enough rendering power.

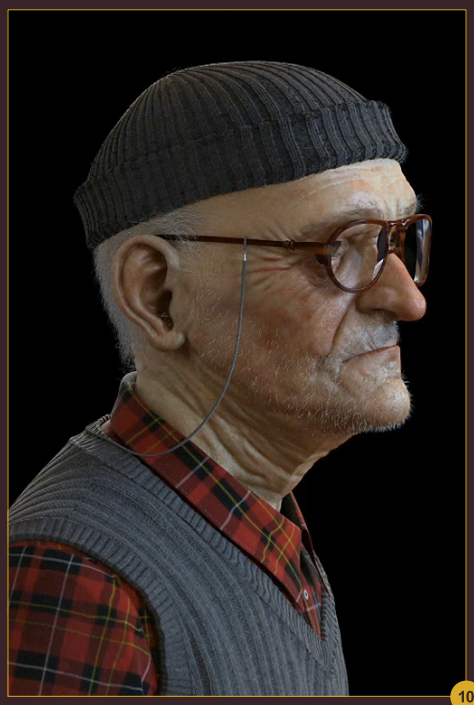
If you encounter a long rendering hang, make sure to increase the Dynamic Memory limit to more than its default 500 MB.

If you are looking for some more control over your renderings, make sure to explore V-Ray's Render Elements, which will provide you with the ability to render different passes like Diffuse, Reflections, SSS and so on.

After you render all the necessary passes you still have some room for improvement in post-processing. One of the most obvious additions in post-processing is a background and it's very important to match the background with the lighting. If you have used an image to light your character, then you could use the same image as the back plate to perfectly match the background with the lighting mood.

Also using the same color correction adjustments for both the character and the background will help you to marry the two elements together better.

I hope you have enjoyed these tutorials and that you will find them useful for your future realistic portrait creations. Thanks for reading!



10

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"I was totally moved by an Israeli movie called 'Eyes Wide Open' and decided I wanted to use what I'd seen in my latest work. For me good artwork needs emotional support."

MAKING OF EYES WIDE OPEN

BY BAOLONG ZHANG

This image, *Eyes Wide Open*, featured in the gallery of our August issue. In this month's Making Of, Guildford-based senior character and environment artist, Baolong Zhang, talks us through how he made this moving image, from concept to final piece.

EYES WIDE OPEN

Software used: ZBrush, Maya and Photoshop

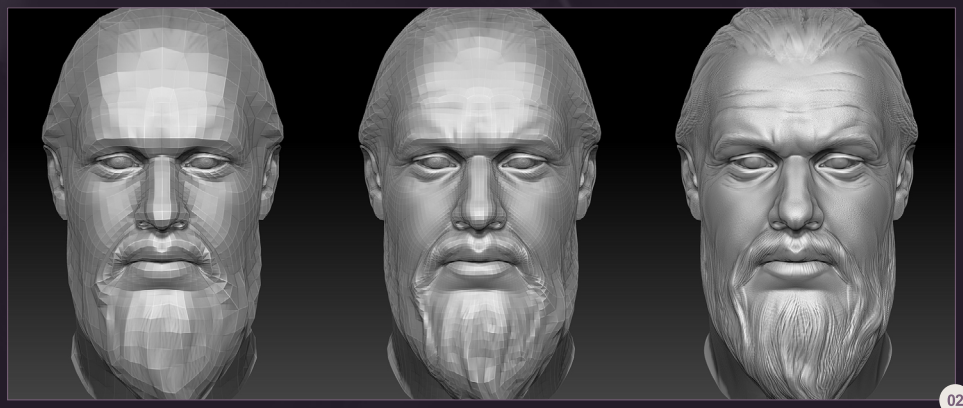
I'm an artist working in the video game industry, and have been a 3DTotal visitor for almost 10 years now. Here is my first tutorial; I hope you like it.

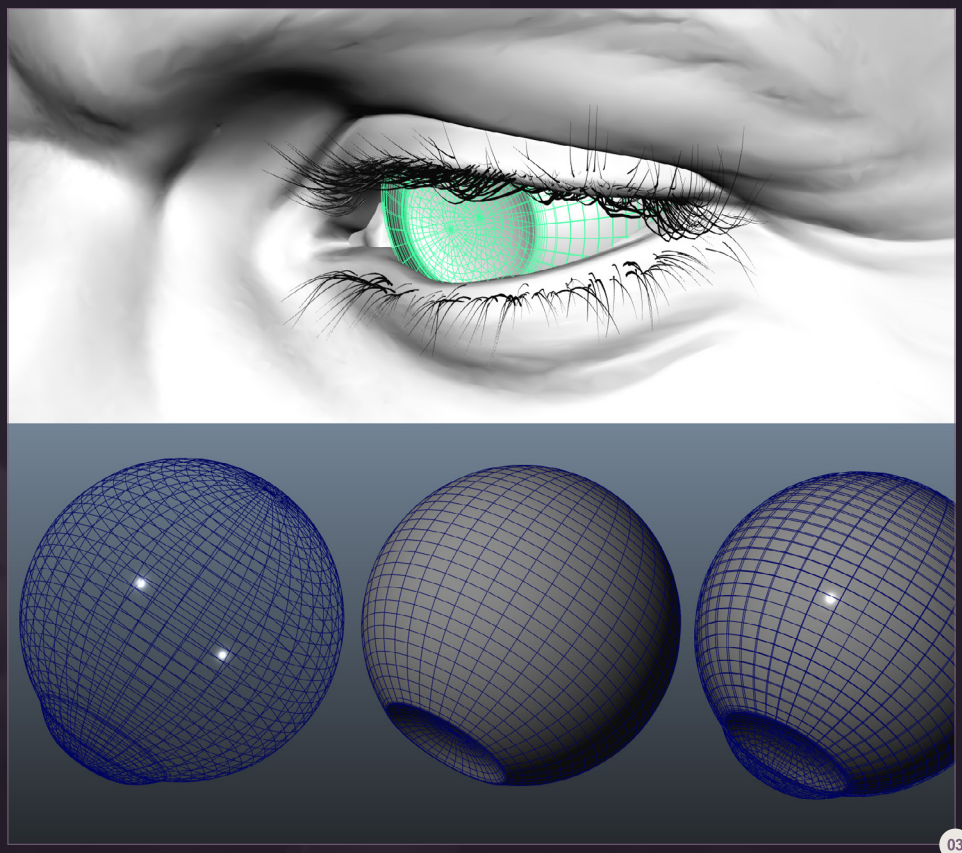
I have always had a passion for traditional art, and always try to approach it with 3D tools. I did this work with ZBrush, Maya and Photoshop (**Fig.01**).


01

First, a little bit about the inspiration behind this piece. I was totally moved by an Israeli movie called *Eyes Wide Open* and decided I wanted to use what I'd seen in my latest work. For me good artwork needs emotional support.

Then I started building a basic concept and mood board, mostly consisting of screenshots from the movie. I decided to start with the man with the beard. I used a base mesh from a previous work, and then moved into ZBrush, which I mostly used for this work (**Fig.02**).


02


03


04

I didn't really want a super-likeness for him, but decided to focus more on his expression. I paid quite a lot of attention to his eyes and you can see the model of these in **Fig.03**.

Then I moved on to the face, where almost all the detail was sculpted. I then exported quite a high res model, around 500K. I could have used the Displacement map for details, but I find it's always a headache getting it to look exactly like the original high res model. As I've got quite a good PC, I decided to just use the high res model instead. For the tiniest details I used a Cavity map from ZBrush as the bump; it was enough for me (**Fig.04**).

The next challenge was the hair and facial hair. I thought they were quite important features when it came to showing his identity, so I had to focus on attention to detail (**Fig.05**).

Before I started, I researched hair a little more, but it turned out pretty hopeless. So, I thought, why don't I try Maya's default hair? I want to say I am not the best with the Hair tool, but it was really what I wanted for this work.

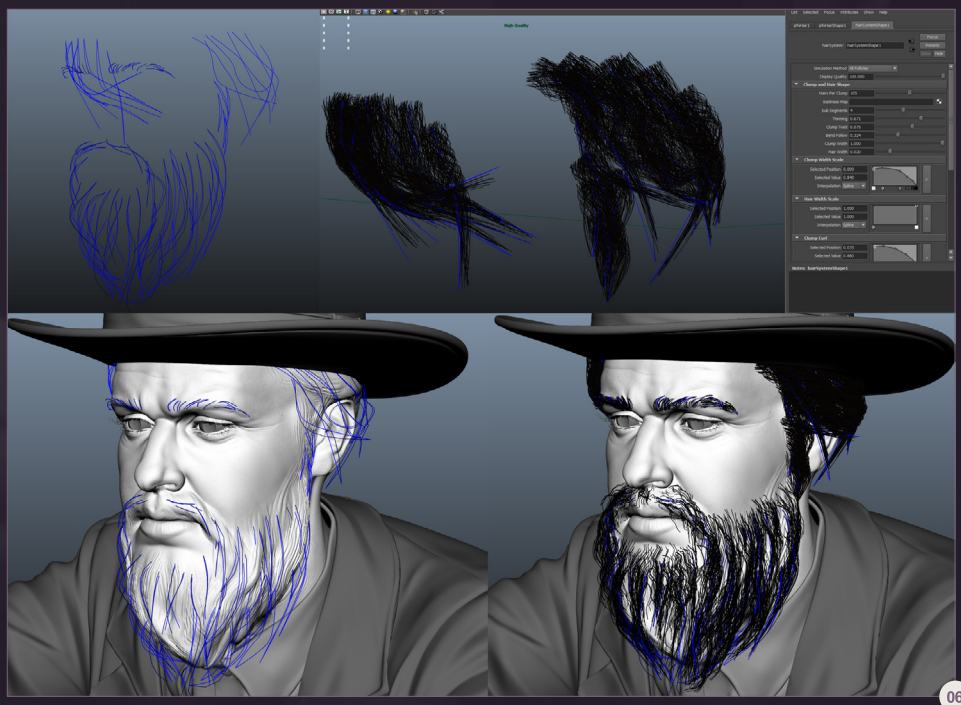
First I created one curve following the head, and then duplicated it one by one. It sounds boring, but I was able to achieve what I wanted this way, which was really good for me. I created the first hair system by growing some hair on a cube, and continued by deleting all the hair from the cube. Then I applied it to my hair curves, before tweaking it until I was happy with the result (**Fig.06**).

Next was the cloth. I started modeling a T-pose cloth base mesh, and after some sculpting, I tried to pose it because cloth changes a lot when it's in a different pose. Then I went on to sculpt the finer details (**Fig.07**).

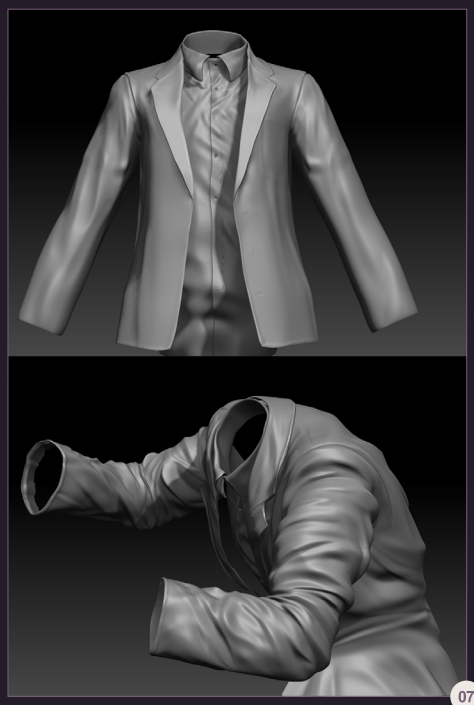
For the skin I used mental ray's fast skin. Scattering Depth was the most important thing;



05



06



07

it changes the most for the SSS result. It does depend on your model's size, so you need to test it before tweaking it. I know I should have done more accurately layered textures, but this already looked pretty good to me (**Fig.08a – b**).

For posing, I used ZBrush Transpose Master; I find it really handy when you have many subtools. It's quick to pose your character.

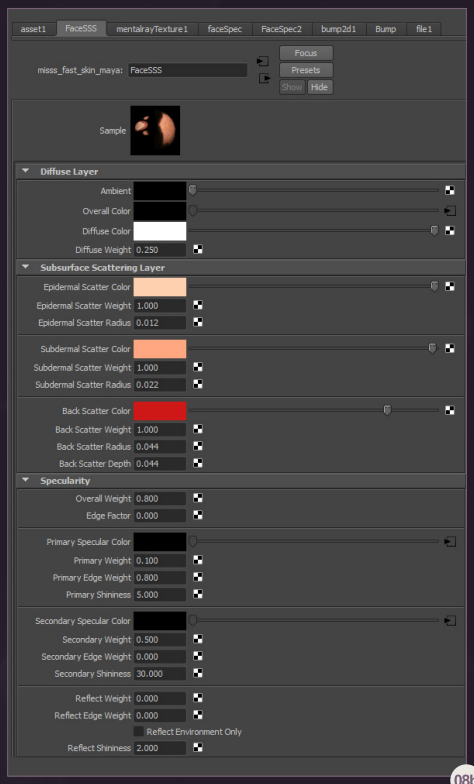
The very last bit to cover is the rendering. It's something huge that can really affect the final atmosphere of your work. For this work, it was quite a big challenge for me, because there were two characters that were interacting with each other. I didn't want them to just be lit; I wanted people to be able to focus on the emotions in their faces and body language.

I had two key lights, as well as two rim lights for each other, and one strong area lit from the back. Over all I chose a cold color, but used a little bit of warm lighting on the bearded man's face, with the colder lighting on the young guy, to show hopelessness and desperation (**Fig.09**).


08a

I didn't do all the render passes; I just rendered out the depth channel for the depth of field in photography. I then added a background from some mixed photos. The important thing was that the light needed to fit my rendering.

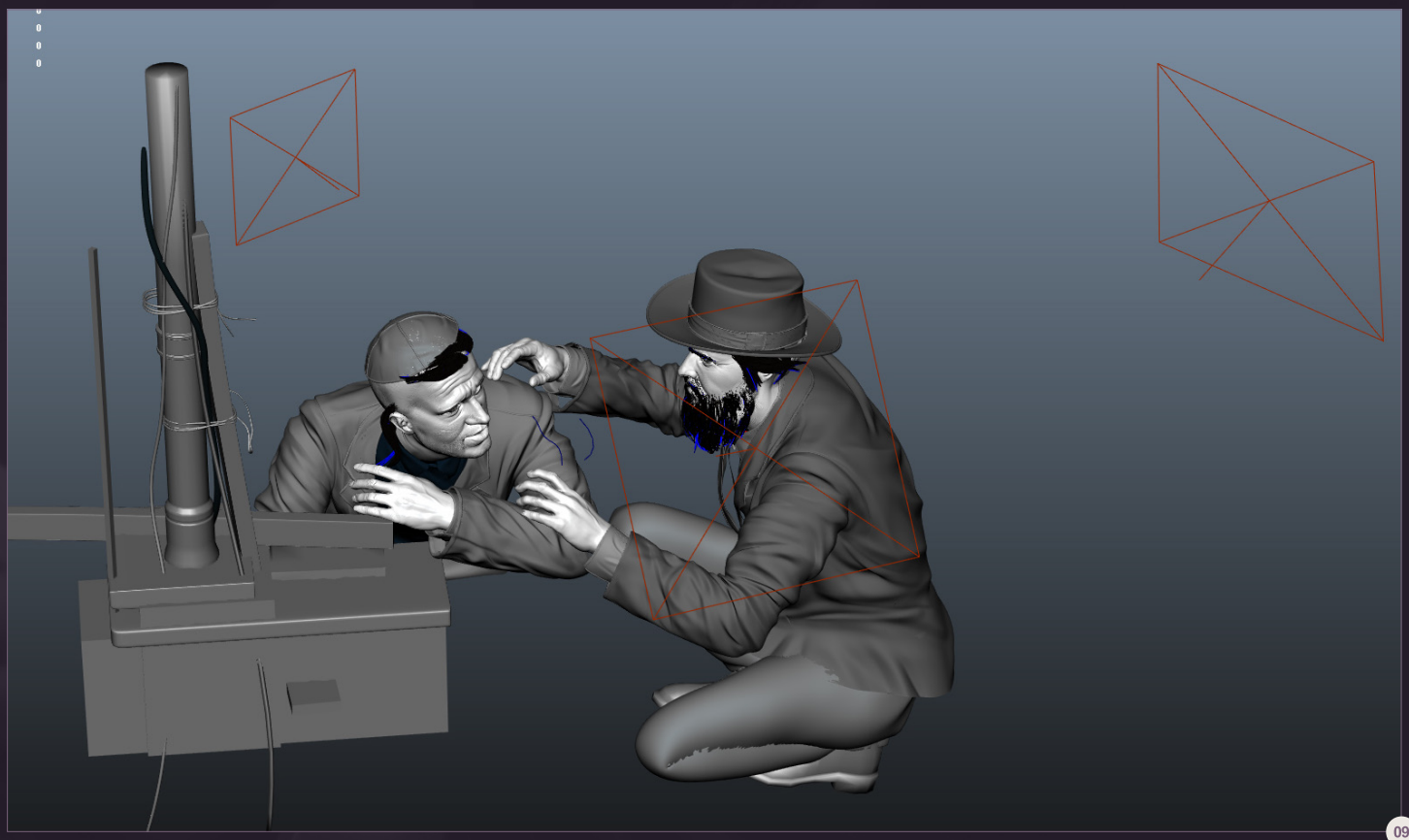
I finally added some little dusty bits in the depth of field (**Fig.10**).



08b

Thanks for reading this and I hope to see you soon.

BAOLONG ZHANG
Email: george0280@hotmail.com


09





3DC next month

Here is what's in next months issue of 3dcreative

Tutorials

Beginners Guide to Modeling Futuristic Vehicles
Chapter 1 - Modeling 1
3ds Max & Maya

Building Droids
Chapter 7 - Bartender Droid
by John Gavin

The Submarine Pen
Environment Creation Using Unreal Games Engine
Chapter 4 - Building Objects and Placement 1
by Andrew Finch

ZBrush Quadrapeds
Chapter 1
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Interviews

Gregory Callahan

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another **10 of the best**
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Digital Art Masters
Volume 6



With the release of 3DTotal's book, *Digital Art Masters: Volume 6*, we have some exclusive chapters for you...

This is more than just an artwork book. Not only does it feature full-color, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

This month we feature:

"Is This Tomorrow?"

by Tomáš Müller



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The following shots of the “Is This Tomorrow?” book pages are featured here in full-resolution and can be read by zooming in...



Is This Tomorrow?

By Tomáš Müller

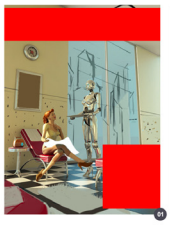
Job Title: Freelancing Commercial Artist

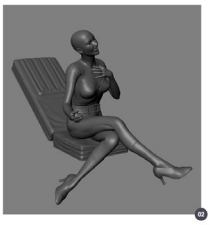
Software Used: 3ds Max, Mudbox, V-Ray and Photoshop CS4

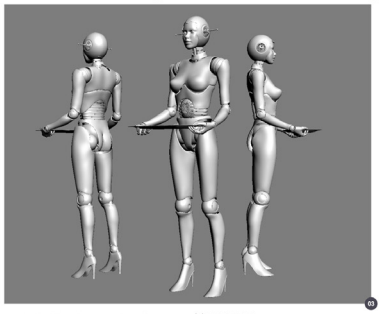


Introduction

Last year I was asked to do a cover illustration for a science magazine called *Technicall*. The main theme of the magazine issue was Robotics. I was given full freedom of expression and since I love sci-fi imagery I was pretty excited about the project. First of all I needed a direction for the theme and style. I often create classic high-tech images as concept art, so after a few sketches and ideas I ended up with a kind of future-retro feeling which best suited the purpose. Personally I love something about every decade of the twentieth century, but there are a few decades I love more for their atmosphere, design style and feeling than the fifties. There are so many cool things about the fifties to choose from, especially pin-up art and B-grade sci-fi movies. I decided to try and end up with an interesting fusion of these two genres. A secondary influence was one of my all time favorite artists, Hajime Sorayama, so this illustration is also a bit of a tribute to him.







> “I like painting onto an unfinished render as it gives me a good idea about whether something will work or not”

Concept

After a few quick sketches I decided to move directly into 3D and figure out what kind of perspective and composition would work best. Composition was my main problem since everything was bound by the magazine layout, which included a logo and the main article in the bottom right corner. Therefore it was a bit difficult to come up with a functional and yet pleasing composition, which also worked with the text and logo. I did lots of WIP sketches throughout the whole process by bringing test renders into Photoshop and trying to figure out the best positions for all of the objects in the scene. This was important in deciding how I could tell the story in the right way without interfering with the layout. Usually I like painting onto an unfinished render as it gives me a good idea about whether something will work or not.

Modeling

After preparing quick base meshes in 3ds Max I did most of modeling in Mudbox. The models were prepared as separate parts and then imported, remodeled and finally detailed (**Fig.01**). Since I didn't use any detailed textures there was no need for any re-topology. As you can see in **Fig.02 – 04**, the models

were quickly unwrapped and imported into 3ds Max as high res meshes, before being smoothed and prepared for rendering. Some of the smaller detailing was done in 3ds Max via the polymodeling tools (**Fig.05**). Unwrapping was applied only to the parts where textures were used like the face, hair and interior objects. It was necessary to not only be creative, but also economical, and resist spending unnecessary time on the processes. For instance, I decided at a later stage to use a modeled base mesh for the hair, combined with hand-painted textures and Opacity maps, compared to a hair plugin that can be time-consuming to set up (**Fig.06**).

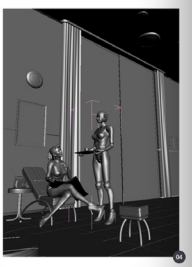
> “In order to maintain an illustrative style I minimized the texturing as much as possible, opting instead to create the atmosphere through shaders, colors and lights”

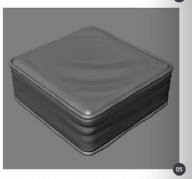
Texturing

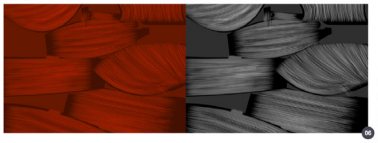
Texturing was actually the easiest part of this illustration. Most of the textures were painted in Mudbox with others either downloaded from some well-known texture sites or made from reference photos. Photo textures were used mainly on the clock and furniture. I knew that this piece was going to be about the little details so I also prepared some custom versions of fifties advertising in the form of wall pictures. In order to maintain an illustrative style I minimized the texturing as much as possible, opting instead to create the atmosphere through shaders, colors and lights.

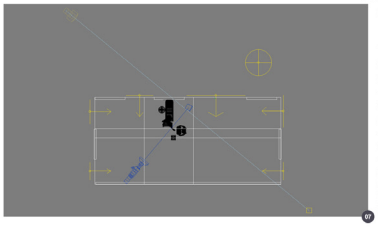
Lighting and Rendering

The scene was rendered in V-Ray using one warm Directional light (standard 3ds Max light), one blue VRay Skylight and a couple of VRay Plane lights behind the windows to increase the exterior light (and also for increasing the number of samples in the scene). It's basically a simple setup often used for daytime interior scenes (**Fig.07**). All the shaders conform to the visual style I had in mind, which was partially flat but rich in color. I decided not to use any realistic-looking effects, like Sub Surface Scattering etc. All the shaders in the scene are based on similar materials that are slightly modified for each part of scene (wall, metal, skin) to make the models look different, but still maintaining consistency.









Background

The background scenery was done separately in Photoshop (**Fig.08**) using a combination of photo textures and digital painting. Later on the background was inserted behind the window during the post-production process. Before starting the background I carried out a few simple renders of some boxes corresponding to the scene perspective, which would eventually represent the buildings. This guaranteed an accurate perspective before I began the painting process. No special brushes were used during the painting, just three default Standard brushes in Photoshop.



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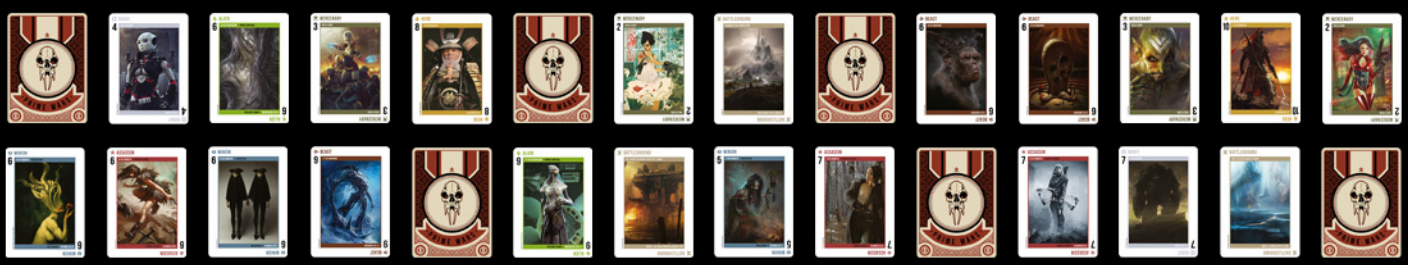
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